Valley Water

2020

North San Jose Shoreline Floodplain Management Plan

April 2020

SANTA CLARA VALLEY WATER DISTRICT

South San Francisco Bay Shoreline Project

NORTH SAN JOSE SHORELINE FLOODPLAIN MANAGEMENT PLAN

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1. INTRODUCTION

1.1 PURPOSE AND SCOPE OF THE DOCUMENT

This Floodplain Management Plan (FMP) for the North San Jose shoreline area assesses the flooding hazards along the southern shoreline of San Francisco Bay north of San Jose, California, including the community of Alviso, California. The FMP summarizes previous and current programs, describes potential mitigation strategies, and presents a plan for future action.

This FMP has been prepared to meet the requirements of Section 202(c), Floodplain Management Plans, of the Water Resources Development Act (WRDA) of 1996. The preparation of a FMP was specifically listed as a condition for Section 202: the non-Federal interest shall prepare a floodplain management plan designed to reduce the impacts of future flood events in the project area within 1-year after the date of signing a project partnership agreement with the United States Army Corps of Engineers (USACE) for construction of a project.

Section 202 requires the development of a FMP to reduce the impacts of future flood events in a protected area and for the local government entity to agree to participate in and comply with applicable federal floodplain management and flood insurance programs. It is the policy of the USACE to promote prudent floodplain management at the non-Federal level by encouraging the non-Federal project sponsor to use and routinely update the FMP as community changes dictate.

As a non-Federal interest for the South San Francisco Bay Shoreline Project (Shoreline Project), the Santa Clara Valley Water District (Valley Water) has prepared this FMP to meet the requirements of Section 202. The Shoreline Project is a partnership with the USACE, California State Coastal Conservancy (Coastal Conservancy), United States Fish and Wildlife Services (USFWS), and Valley Water. The purpose of the Shoreline Project is (1) to provide a higher level of tidal flood risk resiliency throughout the community of Alviso within the City of San José, California: (2) to provide increased ecosystem functions within existing salt ponds through the restoration of tidal marsh and transitional habitats; and (3) to provide recreational opportunities associated with the restored habitat.

The Shoreline Project encompasses 18 miles of coast in Santa Clara County, which is divided into 11 sections, called Economic Impact Areas (EIA). The Shoreline Project is being conducted in phases, beginning with EIA 11 (Shoreline Phase 1 Project) because of its high risk of tidal flooding and important regional infrastructure, such as the San Jose-Santa Clara Regional Wastewater Facility. This FMP's project area covers the area encompassed by EIA 11 of the Shoreline Phase 1 Project. Figure 1.1-1 shows EIA 1 through EIA 11 along the South San Francisco Bay Shoreline.

Once construction of the Shoreline Phase 1 Project is complete, the operations, maintenance, repair, replacement, and rehabilitation (OMRR&R) would be the responsibility of Valley Water for the Flood Risk Management (FRM) features. In general, the project would be inspected and maintained periodically as well as during and after floods by Valley Water. Valley Water does not have land use authority. The land use measures that are presented in this FMP are implemented and enforced by the local jurisdiction including the City of San José and the County of Santa Clara. Valley Water educates and advocates for the protection of the FMP project area from flood hazards; however, Valley Water's role is limited and includes the construction and maintenance of the Shoreline Phase 1 Project.

The FMP is intended to be a living document. It will be reviewed by Valley Water on a continual basis and updated to reflect progress with programs and projects identified within this plan as well as relevant changes in local, state, or federal regulations enacted after the adoption of the plan. In addition, it will be updated, as required, to ensure accuracy of data and to meet the requirements of the National Flood Insurance Program (NFIP).

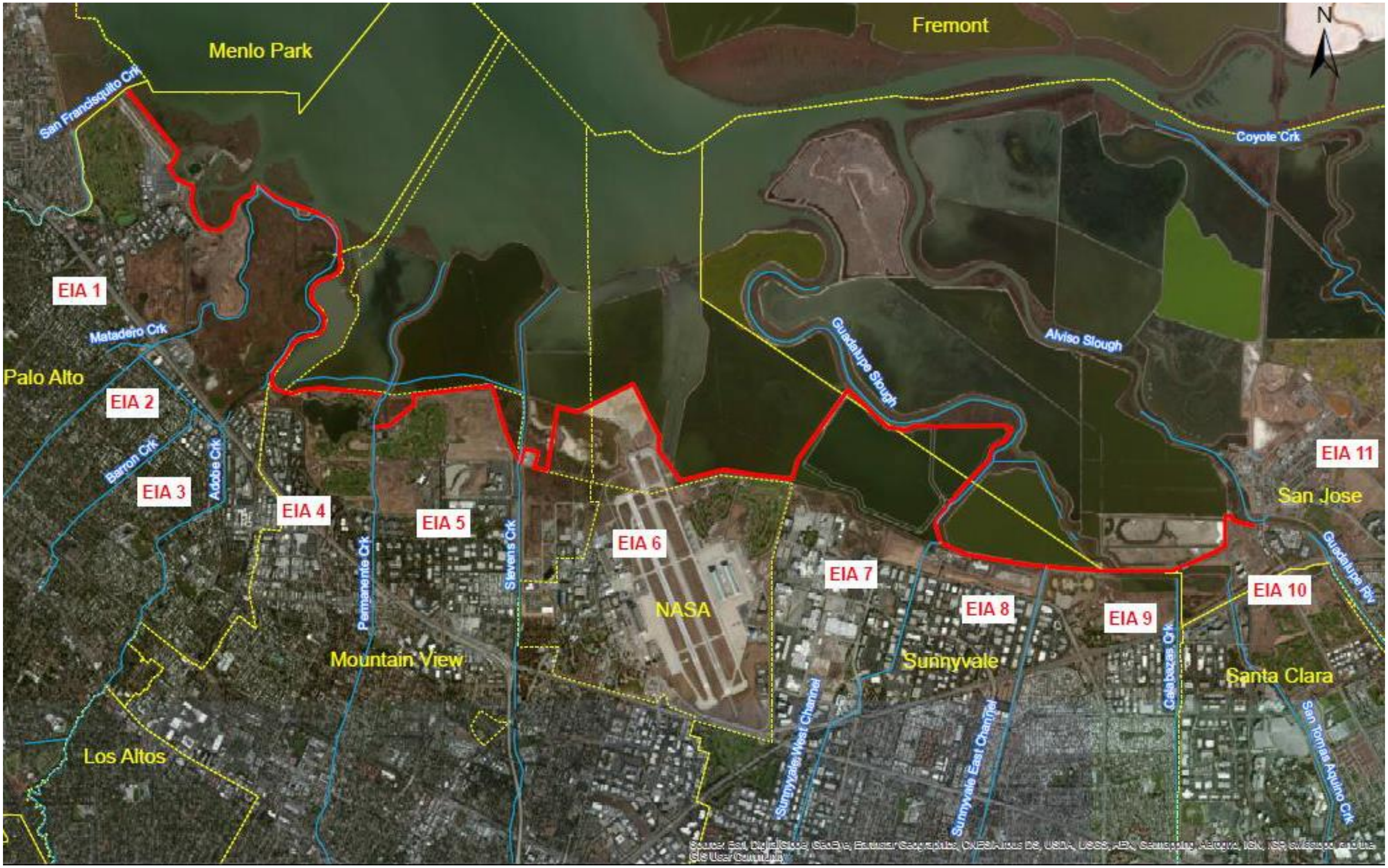

FIGURE 1.1-1
South San Francisco Bay Economic Impact Areas (EIA)

1.2 COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program within the National Flood Insurance Program (NFIP) that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions meeting the following three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community would receive a 45 percent premium discount, and a Class 9 community would receive a 5 percent discount. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The discount partially depends on location of the property. Properties outside the special flood hazard area (SFHA) receive smaller discounts: a 10-percent discount if the community is at Class 1 to 6 and a 5-percent discount if the community is at Class 7 to 9.

The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public information
- Mapping and regulations
- Flood damage reduction
- Flood preparedness

Per the Santa Clara County Operational Area Hazard Mitigation Plan (SCCOAHMP) the City of San José has been participating in the CRS program since 1991. As of 2014, the City of San José reached a CRS rating of Class 7. The properties located inside of the SFHA zones currently receive a 15-percent premium discount and properties outside of SFHA zones receive a 5-percent premium discount. In 2014, San Jose had a total premium savings of $1,234,021 (SCCOAHMP, 2017).

Many of Valley Water’s activities qualify for CRS credit however Valley Water is not a land use agency nor member of the NFIP; therefore, a fictitious community was created which allows Valley Water to be in partnership with the Santa Clara County CRS communities. The goals of the fictitious community are:

- Ensure that all qualifying Valley Water activities meet CRS criteria to maximize points.

- Ensure that communities receive CRS credit for Valley Water activities.

- Streamline documentation for all communities.

- Continually update the list of qualifying activities.

- Encourage local cities and county to participate in the CRS.

1.3 GOALS OF THE FMP

The principal goal of Valley Water's floodplain management program and this FMP is to minimize losses associated with flooding. Other goals of this FMP include:

- Promote disaster-resistant future development.
- Increase public understanding and support for effective hazard mitigation.
- Reduce the possibility of damage and losses to existing assets, including people, critical facilities/infrastructure, and public facilities due to floods.

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2. COMMUNITY PROFILE

2.1 GEOGRAPHY, DEMOGRAPHICS, AND CLIMATE

The Shoreline Phase 1 Project area is located within the City of San José along the southern shoreline of San Francisco Bay between Guadalupe River/Alviso Slough and Coyote Creek. It includes a portion of the Alviso salt ponds complex and the Don Edwards Wildlife Refuge, the community of Alviso, and the San Jose-Santa Clara Regional Wastewater Facility (Wastewater Facility). The project area includes former salt ponds owned by the USFWS (Ponds A9–A15) and by the City of San José (Pond A18). Figure 2.1-1 outlines the area covered by this FMP in red and is designated as EIA 11. The project area includes a mix of tidal, diked marsh, managed ponds, and upland habitats as well as residential, industrial, and commercial structures (Shoreline Feasibility Study, 2015). The project area is adjacent to the bay and has been significantly impacted in the past by riverine flood events (Guadalupe River Park Conservancy Website 2019). The community of Alviso has been subjected to high rates of subsidence from groundwater withdrawal for agriculture for the first half of last century, causing lands to sink by four to six feet, and thus significant damage is expected to occur at in-basin water surface elevations of just over 5 ft (NAVD 88) (Shoreline Feasibility Study, 2015).

The community of Alviso, which is part of the City of San José and is located adjacent to the former salt ponds, is the largest residential community within the project area. Alviso, annexed by the City of San José in 1968, is located at the very northern edge of San José in Santa Clara County. The Alviso community includes all properties within the City of San José north of State Route 237 between Coyote Creek and Guadalupe River/Alviso Slough. The community has approximately 2,100 residents and 600 housing units and a median income of $58,304 (Shoreline Feasibility Study, 2015).

The South Bay area has a mild Mediterranean climate. San Francisco Bay strongly influences the temperatures of the areas closest to the shoreline because of the influence of the marine environment and onshore winds. Summers are mild, with average temperatures in the 70s (Fahrenheit), and winters tend to be cool, with average temperatures in the 50s (Shoreline Feasibility Study, 2015).

Typically, most rainfall occurs during the cooler months, with approximately 80 percent of the area's rainfall occurring from November to March. The valley floor has an average annual rainfall of approximately 15 inches, while the Santa Cruz Mountains to the west and the Diablo Range to the east average approximately 50 and 24 inches of rainfall per year, respectively. Snow is rare at low elevations and is a minor component of precipitation even at higher Elevations (Shoreline Feasibility Study, 2015).

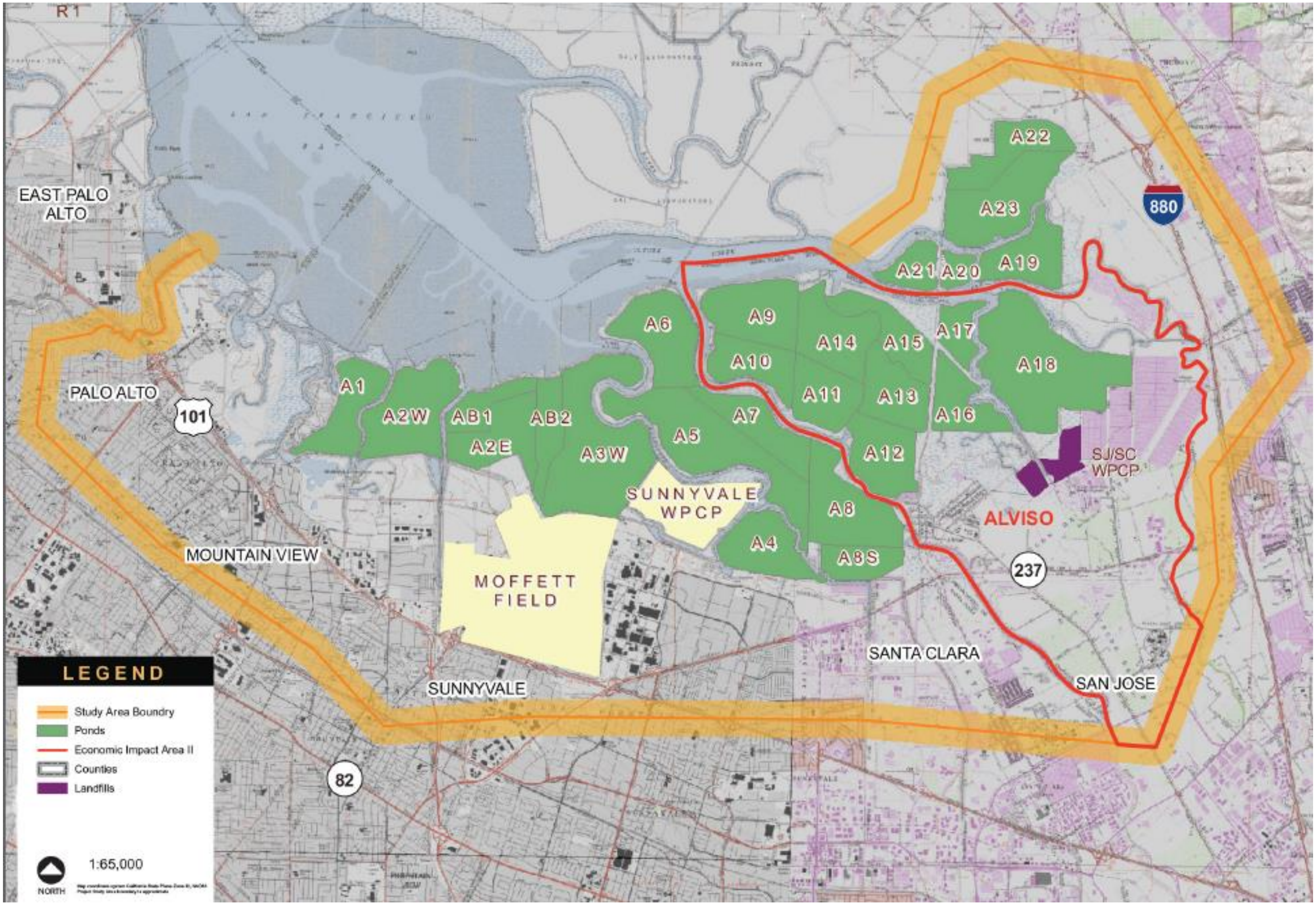

FIGURE 2.1-1
Map of FMP Project Area

2.2 INFRASTRUCTURE

In 1956, the Wastewater Facility was built just east of the residential area of Alviso. Upgraded in 1964 and 1979, the plant today treats and cleans the wastewater of more than 1,500,000 people who live and work in the over 300-square-mile area encompassing the cities of San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Saratoga, and Monte Sereno. Most of the final treated water from the Wastewater Facility is discharged as fresh water through Artesian Slough and into the South Bay. About 10 percent is recycled through South Bay Water Recycling pipelines for landscaping, agricultural irrigation, and industrial needs around the South Bay (Shoreline Feasibility Study, 2015).

The current Wastewater Facility site is 2,684 acres, which includes a 175-acre wastewater processing area, a 750-acre sludge-drying area, and Pond A-18 an 850-acre former salt production pond (Shoreline Feasibility Study, 2015).

The Wastewater Facility is jointly owned by the cities of San Jose and Santa Clara, and is managed and operated by the City of San José’s Environmental Services Department. The city councils of San José and Santa Clara, the Treatment Plant Advisory Committee (TPAC), and the Technical Advisory Committee (TAC) oversee the Wastewater Facility’s activities (City of San José Website, 2020).

2.3 HYDROLOGY

The surface water hydrology of the South Bay area has been greatly altered by human activity. Flat valley areas adjacent to the San Francisco Bay have undergone rapid and extensive urbanization over the last 70 years. The surrounding foothills have undergone some low-density urbanization, while the steep mountainous regions have remained mostly rural open space. In keeping with urbanization of the valley floor, the creek channels have also been modified over the years, first as the valley was developed for agricultural purposes in the late 1800s and later because of urbanization. As urban development occurred over the years, many of the creek channels were moved, realigned, and straightened. Today, most of the creek channels are a combination of earthen trapezoid and concrete channels, box culverts, bypasses, floodwalls, and levee systems (Shoreline Feasibility Study, 2015).

Most freshwater inflows entering the South Bay occur during winter and spring. Figure 2.3-1 demonstrates the drainage path of surface water as it makes its way through the South Bay watersheds to drain into the South San Francisco Bay. A major source of freshwater inflow during summer months and dry years is the effluent from municipal wastewater treatment plants in the region (Shoreline Feasibility Study, 2015).

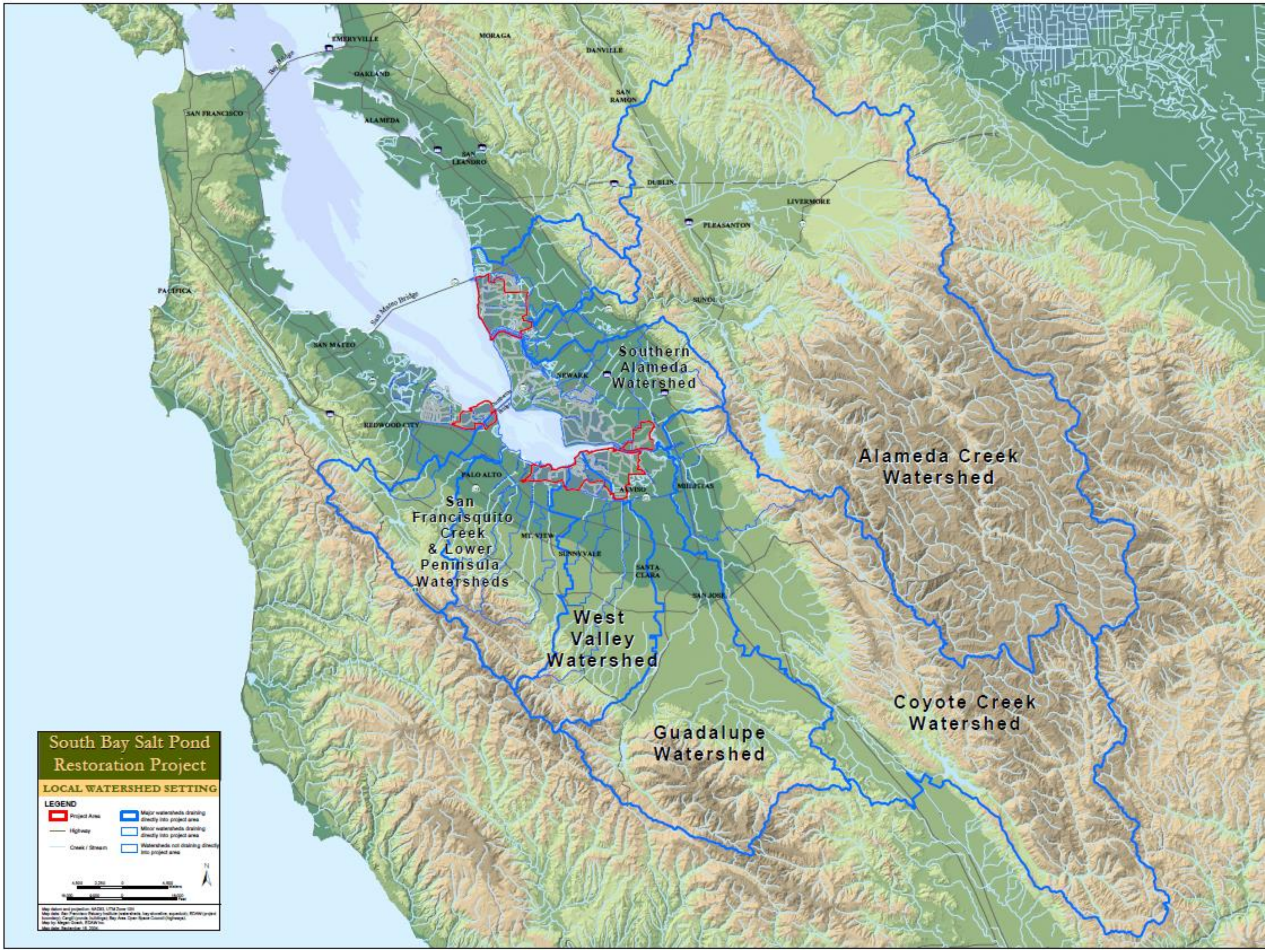

FIGURE 2.3-1
Santa Clara County Major Watersheds

2.3.1 Coyote Creek and Guadalupe River

Coyote Creek, along the eastern border, and Guadalupe River/Alviso Slough, along the western border, define the hydrologic boundaries of the project area. Coyote Creek originates in the Diablo Mountain Range and flows in a northeasterly direction through the cities of Morgan Hill, San Jose, and Milpitas before flowing into the San Francisco Bay. Coyote Creek is bounded by the Guadalupe River Watershed on the west and by the Diablo Mountain Range on the east. The USACE and Valley Water built a flood risk reduction system on the lower portion of Coyote Creek. The USACE (Sacramento District) designed and built the reach upstream of State Route 237 to Montague Expressway and Valley Water designed and built the reach downstream of State Route 237 (Shoreline Feasibility Study, 2015).

Guadalupe River originates in the Santa Cruz Mountains and flows directly into San Francisco Bay, via Alviso Slough. The Guadalupe River basin is characterized by steep slopes in the mountains with a large, wide valley. The valley area is relatively flat and highly urbanized. The river flows through the heart of Silicon Valley and downtown San Jose. Major tributaries to the Guadalupe River include the Guadalupe Creek, Los Gatos Creek, Canoas Creek, Ross Creek, and Alamitos Creek watersheds (Shoreline Feasibility Study, 2015).

The hydrology for Coyote Creek and Guadalupe River are derived from USACE's 1997 Engineering Hydrologic Office Report for Guadalupe River and Coyote River. This is the same hydrologic analysis used in the USACE's flood risk reduction projects. The 1977 results were updated for the year 2010 conditions for the Guadalupe River. In November 2009 USACE's San Francisco District completed the Guadalupe Watershed Hydrologic Assessment. The 2009 study updated the study methodology and results of the 1977 hydrology (Shoreline Feasibility Study, 2015). The peak flood discharges from USACE's 1977 and 2009 hydrologic analysis for Guadalupe River and Coyote Creek are shown in Table 2.3-1 (Guadalupe River and Coyote Creek Peak Discharges). Valley Water performed a hydrologic analysis on Coyote Creek in 2017. The peak flood discharge from Valley Water's hydrologic analysis are also shown in Table 2.3-1.

TABLE 2.3-1
Peak Flood Discharges for Guadalupe River and Coyote Creek

Location	Drainage Area (sq. mi.)	Percent Chance Exceedance/Peak Discharge (cfs)							
		50.0%	20.0%	10.0%	4.0%	2.0%	1.0%	0.4%	0.2%
Guadalupe River at San Jose (USACE, 1977)	144	2,700	4,500	6,700	9,700	13,500	17,000	21,000	32,000
Guadalupe River at San Jose (USACE, 2009)	146	3,317	6,059	7,712	10,463	14,251	17,967	22,431	27,942
Coyote Creek at State Route 237 (USACE, 1977)	321	3,300	6,200	8,400	10,500	13,000	14,500	16,000	18,000
Coyote Creek at State Route 237 (Valley Water, 2017)	321	N/A	4,820	7,090	10,250	12,720	15,360	17,750	21,070

2.3.2 Tidal Hydraulics

Tides and tide ranges are highly variable through the length of San Francisco Bay. Tides move through the narrow opening at the Golden Gate Bridge but are modified by bottom bathymetry, the shoreline, and the earth's rotation as they propagate throughout the San Francisco Bay estuary. Tides in San Francisco Bay are mixed semidiurnal, with two high and two low tides of unequal heights each day. The tides exhibit strong spring-neap variability, with the spring tides (larger tidal range) occurring approximately every two weeks during full and new moons. Neap tides (smaller tidal range) occur approximately every two weeks during the moon's quarter phases. The tides also vary on an annual cycle in which the strongest spring tides occur in late spring and early summer and then late fall and early winter (which may be commonly referred to by the public as king tides), and the weakest neap tides occur in spring and fall (Shoreline Feasibility Study, 2015).

The South San Francisco Bay area (South Bay) has elevated tides relative to the Pacific Ocean and the rest of San Francisco Bay. The maximum tide levels generally increase with distance southward. As the tides propagate from the Pacific Ocean into San Francisco Bay, in the form of shallow water waves, the tide amplitudes and phases are modified by bathymetry, reflections from the shores, the earth's rotation and bottom friction. The enclosed nature of the bay creates a mix of progressive and standing-wave behavior for tides, meaning these waves are reflected back on themselves causing an amplification of the tides and an increase in tidal range with distance from the Golden Gate Bridge. The addition of the reflected wave to the original wave increases the tidal amplitude. Amplification causes the tidal range in the South Bay to increase southward. Tidal Ranges in South San Francisco Bay based on the last two National Tidal Datum Epochs. The tide range increases from 5.84 feet (NAVD 88) at the San Francisco tide gage to 9.28 feet (NAVD 88) at the Alviso Slough tide gage (Shoreline Feasibility Report, 2015).

2.4 WATERSHEDS

The project area is contained within the downstream portion of the Coyote Watershed and is bordered to the west by the Guadalupe Watershed, where the Guadalupe River/Alviso Slough serves as the border between these two watersheds. The Coyote and Guadalupe watersheds, along with three other watersheds, all drain into South San Francisco Bay.

The Coyote Watershed drains sixteen major creeks (as shown in Figure 2.3-1, page 2-4) and approximately 325-square miles into San Francisco Bay. The Coyote Watershed is the largest in the County of Santa Clara; it extends from the urbanized valley floor upward to the vast natural areas of the Mt. Hamilton range. The Guadalupe Watershed drains five major creeks and encompasses approximately a 170-square mile area that drains the Guadalupe River and its tributaries through downtown San Jose into the San Francisco Bay (as shown in Figure 2.3-1, page 2-4) (Valley Water Website, 2020).

The valley floor of both the watersheds once consisted of broad alluvial fans that were formed as streams emerged from the foothills, flattened, slowed and spread out, dropping out unconsolidated material. The watersheds can now be characterized as a primarily flat valley area adjacent to San Francisco Bay, which has undergone rapid and extensive urbanization. The upstream foothills have undergone minor low density urbanization, while the steep mountainous regions have remained mostly rural, open space (Shoreline Feasibility Study, 2015).

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3. PLANNING PROCESS AND PUBLIC PARTICIPATION

3.1 BACKGROUND

The project area is located along the southern shoreline of the San Francisco Bay and has large areas of low-lying terrain that are bordered by non-engineered pond dikes originally designed and constructed for commercial salt pond purposes rather than for flood risk management. Thus, the project area is susceptible to tidal flooding that poses a threat to life and safety and can cause significant property damage.

Though several government agencies and community groups attempt to mitigate flood hazards, a floodplain management plan integrates the community's efforts into one comprehensive program of activities. A floodplain management plan serves the following beneficial purposes for the Alviso community:

- Identify existing and future flood related hazards and their causes.
- Ensure that a comprehensive review of all possible activities and mitigation measures are considered so that the most appropriate solutions will be implemented to address the hazard.
- Ensure that the recommended activities meet the goals and objectives of the community, are in coordination with land-use and comprehensive planning, do not create conflicts with other activities, and are coordinated to reduce the costs of implementing individual activities.
- Ensure criteria used in community land-use and development programs account for the hazards faced by existing and new development.
- Educate residents and property owners about hazards, loss reduction measures, and the natural and beneficial functions of floodplains.
- Build community support for activities and projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains.

The sections that follow discuss the efforts undertaken to involve the public, neighboring communities, and local and regional agencies involved in hazard mitigation activities in the development of the FMP.

3.2 PLANNING AND PUBLIC PARTICIPATION

The focus of this FMP is the community of Alviso in San Jose, California that is at risk of a 1% annual chance flood event and tidal flooding. As part of the Feasibility Study of the South San Francisco Bay Shoreline Phase 1 Project (Shoreline Study), performed by the USACE, the USFWS, and the non-Federal sponsors, the Coastal Conservancy, and Valley Water, a public involvement period was incorporated into the development of the Feasibility Study. This FMP has adopted the public involvement process that was performed for the Shoreline Study and used the public comments and concerns gathered during the Shoreline Study to develop this FMP.

Public involvement for the Shoreline Study included ongoing stakeholder coordination and opportunities to comment on the scope and content of the study. Public involvement for the Shoreline Study occurred through a stakeholder forum originally convened for the South Bay Salt Pond Restoration Project (SBSP Restoration Project). Forum meetings occurred once a year and were open to the public.

Representatives from the agencies (USACE, USFWS, Coastal Conservancy, and Valley Water) involved in the development of the Shoreline Study participated in the Alviso and Santa Clara County Working Group, which provided study progress updates and collected comments from interested stakeholders. While the work group welcomed information and participation from all interested residents and stakeholders in the community, the team targeted property owners and renters and neighboring properties facing similar flood risk.

The following paragraphs describe the Shoreline Study project scoping phase that occurred in 2006 and the draft Integrated Document public review cycle that ended in February 2015.

3.2.1 Shoreline Feasibility Study Scoping Activities

The USACE, USFWS, the Coastal Conservancy, and Valley Water initiated a 30-day scoping process for the Proposed Project with release of the Notice of Intent (NOI) and the Notice of Preparation (NOP) on January 6, 2006. In the NOI and the NOP, the agencies asked for public comment on project scope and document content. The NOI was published in the Federal Register (71 FR 924–927). The NOP was distributed through the State Clearinghouse to trustee and interested agencies. The Coastal Conservancy and Valley Water also published the NOI and the NOP at www.southbayrestoration.org and www.southbayshoreline.org. (Shoreline Feasibility Study, 2015).

As a result of the NOI/NOP postings, eight written comments were received by postal mail and email. The comments provided information for consideration during planning, requested agency inclusion in document distribution, and/or provided information on aviation safety (Shoreline Feasibility Study, 2015).

A public scoping meeting was sponsored on January 25, 2006, from 5:30 to 8:30 p.m., at the Milpitas Community Center, Milpitas, California. Meeting presentations and materials provided an overview of the Shoreline Study, the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) process, and an explanation of the relationship between the Shoreline Study and the SBSP Restoration Project. Thirty-six people attended the meeting and comments and questions were received at the meeting and by postal mail and email (Shoreline Feasibility Study, 2015).

The geographic footprint of the Shoreline Study was reduced and as a result, Valley Water issued a revised NOP on September 8, 2014. The NOP was open for a 30-day period for agencies and the public to comment on the revised project scope and the document content. Six letters were received during this comment period (Shoreline Feasibility Study, 2015).

3.2.2 Summary of Public Concerns from Shoreline Feasibility Study

3.2.2.1 2006 Notice of Intent/Notice of Preparation Comments

Scoping comments received in 2006 were for the original Shoreline Study area that included a much larger footprint in the South Bay (see Figure 2.1-1). Comments and concerns raised during scoping in 2006 are listed below (Shoreline Feasibility Study, 2015):

- Study timeline and responsibility for meeting schedules;
- Integration with the SBSP Restoration Project, San Francisquito Creek Study, Stevens Creek and Charleston Slough projects, and other local projects;
- Potential impacts on environmental resources for consideration, such as:
    - Impacts associated with potential flooding of wastewater treatment plants in the Silicon Valley,
    - Consideration for sensitive species in 100-year floodplain,
    - Potential for increased bird strikes at Moffett Field;
- Flooding impacts to communities, including local landfills and potential to remove businesses and residents from FEMA floodplain; and
- Necessary permits for construction for State Lands Commission and Caltrans coordination.

3.2.2.2 2014 Notice of Preparation Comments

Six letters were received during Valley Water's re-scoping activities in September 2014. The main comments included (Shoreline Feasibility Study, 2015):

- Environmental impacts, such as construction traffic, noise, and impacts to sensitive species and historic sites;
- Impacts and assessment related to sea level change;
- Local plans initiated and/or approved since 2006, such as the Wastewater Facility's Plant Master Plan;
- Maximizing availability of outboard wetland areas for sensitive species; and
- Public use of levees as part of local trail system.

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4. FLOODING HISTORY

The community of Alviso has been subjected to high rates of subsidence from groundwater withdrawal for agriculture for the first half of last century, causing lands to sink by four to six feet. Beginning in 1971, surface water importation from the San Francisco Regional Water System and State Water Project virtually halted further subsidence in the region by offsetting the need for groundwater pumping. While the subsidence has stopped, large portions of Alviso remain below sea level (as there is no mechanism to raise the land once it has subsided), making Alviso very susceptible to flooding.

Alviso is bordered by two watercourses, Coyote Creek to the east and Guadalupe River to the west, making Alviso vulnerable to riverine flooding. Alviso has experienced riverine flooding many times in the past with the most notable recent event being the flood from Guadalupe River in January of 1983. The community of Alviso has not historically suffered from a bayside (tidal) flood event. While there has been no recorded tidal flood event at Alviso, the January 1983 Guadalupe River flood event also corresponded with coastal storms and extreme high tides (including the largest recorded elevation in the 105-year record of the San Francisco Gage on January 27, 1983). The Sunnyvale West Channel flood was attributed to tidal flooding on January 27, 1983, and it is possible that the Guadalupe River flood event occurring at the same time could have masked any tidal flooding at Alviso; or the high tides may not have directly caused any flooding, but exacerbated the riverine flooding from Guadalupe River (Shoreline Feasibility Study, 2015).

Additionally, the Guadalupe River experienced severe riverine flooding events in 1862, 1895, 1911, 1955, 1958, 1963, 1969, 1982, 1986 and 1995 flooding San Jose's downtown and Alviso Community (Shoreline Feasibility Study, 2015).

The Coyote Creek experienced severe flooding events as a result of the major storm events in March and April of 1982. The 1982 storms resulted in flooding in Alviso and in the City of Milpitas. The flood waters reached Alviso and residents on Pacific Avenue, Michigan Street, Grand Street and the surrounding areas voluntarily evacuated the area. Alviso was flooded easterly of the Union Pacific Railroad tracks. An estimated total of 262 homes and 60 businesses were flooded in Mobile Parks West and Alviso (Valley Water Flood Report, 1982).

From January to March of 1983 Coyote Creek experienced another severe flooding event. Coyote Creek flooded in San Jose between State Route 237 and the Bay during the January storm on both the west and east sides of the creek. Flooding affected over 200 acres of agricultural land including farm buildings and several homes (Valley Water Flood Report, 1983).

The storm event in February and March of 1983 caused extensive flooding to the North San Jose, Alviso and Milpitas areas. Coyote Creek flooded a large area during this storm. Water covered much of the area between Lower Penitencia Creek and the Guadalupe River and from Montague Expressway north to the Cargill Salt Pond dikes, a total flooded area of about 4,000 acres (Valley Water Flood Report, 1983). Coyote Creek overflowed its banks between State Route 237 and the Bay. The depth of water surrounding the Wastewater Facility to the west of Coyote Creek became so great that employees had to be flown out by helicopter. Floodwater elevations at the plant reached elevation 9.8 feet (NGVD) (Valley Water Flood Report, 1983).Floodwaters overtopped and entered Alviso. Mandatory evacuation was ordered by the City Manager of San Jose at this time, and approximately 1,700 people were evacuated.

Flooding in Alviso eventually reached depths from three to seven feet. It was estimated by the City of San José that an estimated 362 homes sustained major damage and 13 homes and 40 businesses sustained lesser damages. Total damages to structures in Alviso were estimated at $6.0 million (Valley Water Flood Report, 1983).

5. HAZARD IDENTIFICATION AND RISK ASSESSMENT

This chapter focuses on describing flood hazards as they exist in the community of Alviso and building upon information presented in the Santa Clara County Operational Area Hazard Mitigation Plan (SCCOAHMP) prepared by the Office of Emergency Services of the County of Santa Clara in 2017. Santa Clara County and a partnership of local governments within the county have developed a hazard mitigation plan to reduce risks from natural disasters in the Santa Clara County Operational Area. The SCCOAHMP included a qualitative examination of the vulnerability of important facilities and infrastructure associated with various communities in the County of Santa Clara County including unincorporated and incorporated jurisdictions of the County. The SCCOAHMP also reviewed the history of disasters in the County of the Santa Clara and assessed the needs through a comprehensive flood mitigation strategy. The plan complies with federal and state hazard mitigation planning requirements to establish eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs. The hazard identification and risk assessment in this FMP is intended to identify the types of flooding the community of Alviso is vulnerable to.

5.1 DEFINITION OF FLOOD

A flood is defined as an overflowing of a large amount of water beyond its normal confines, especially over what is normally dry land. Floodplains are the low, flat, periodically flooded lands adjacent to rivers, lakes, and oceans that are subject to these water flows. Most injury and death from floods is a result of people being swept away by high-velocity flood currents, and property damage typically occurs as a result of inundation of sediment-laden water. Floods are often described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence.

5.2 FLOOD HAZARD RISK

Two principal watersheds traverse through the project area, the Coyote and Guadalupe watersheds. The most common potential flooding types in the project area are riverine flooding and tidal flooding (Shoreline Feasibility Study, 2015). The following outlines the types of flooding to which the project area is subject:

5.2.1 Riverine Floods

Riverine flooding is overbank flooding of rivers and streams. Natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas inundated by the 100-year flood with flood depths of only 1 to 3 feet. These areas are generally flooded by low-velocity sheet flows of water. Two types of flood hazards are generally associated with riverine flooding:

- Inundation—Inundation occurs when floodwater is present and debris flows through an area not normally covered by water. These events cause minor to severe damage, depending on velocity and depth of flows, duration of the flood event, quantity of logs and other debris carried by the flows, and amount and type of development and personal property along the floodwater's path.

- Channel Migration—Erosion of banks and soils worn away by flowing water, combined with sediment deposition, causes migration or lateral movement of a river channel across a floodplain. A channel can also abruptly change location (termed "avulsion"); a shift in channel location over a large distance can occur within as short a time as one flood event.

Coyote Creek and Guadalupe River exist in the FMP project area, however these riverine systems have been improved by leveed systems that are FEMA certified for a 1-percent ACE.

5.2.2 Tidal Floods

Tidal floods are characterized by inundation of normally dry lands by bay waters, often caused by extreme high tide events that result in shallow flooding of low-lying coastal areas. Colloquially known as "King Tides," extreme high level tide events are the highest predicted high tide events of the year at a coastal location. These tides exceed the highest water level reached at high tide on an average day and normally occur once or twice per year. King Tide events are the leading cause of flooding by bay waters (Shoreline Feasibility Study, 2015).

Tidal flooding is becoming increasingly exacerbated by sea level rise as a result of climate change or tectonic activity average daily water levels are rising along with the oceans. As a result, high tides are reaching higher and extending further inland than in the past (Shoreline Feasibility Study, 2015). Areas identified as vulnerable to flooding are depicted on FEMA's Flood Insurance Rate Maps (FIRMs), which were developed through the NFIP, and on flood maps developed by the County of Santa Clara.

The FEMA flood zones represent the areas susceptible to the 1% annual chance flood (often referred to as the "100-year flood"), and the 0.2% annual chance flood ("500-year flood").

The 1% annual chance flood, also known as the "base flood," has at least a 1% chance of occurring in any given year, and at least a 26% chance of occurring over the life of a typical 30-year mortgage. FEMA designates this area as the Special Flood Hazard Area (SFHA) and requires flood insurance for properties in this area as a condition of a mortgage backed by federal funds. The project area's rivers, 1% annual chance floodway, and 1% and 0.2% annual chance flood areas in the County of Santa Clara are shown in Figure 5.2-1, which was taken from the SCCOAHMP. In Figure 5.2-2, the flooding area of the FMP project area is shown located north of State Route 237, east of US-101, and west of Interstate-680.

Tidal flooding threats to the FMP project area are the result of extreme tidal water levels interacting with Alviso Slough, Coyote Creek or the dike-pond system that surrounds the project area. These extreme water levels occur due to a combination of high astronomical tides, additional tidal elevation associated with meteorological events and wind-wave run-up in the bay or managed ponds, in some cases augmented by localized wind stress along the non-engineered pond dikes. Dikes may also fail due to high water levels, leading to flooding of additional low-lying areas not normally accessible to tidal waters (Shoreline Feasibility Study, 2015). Figure 5.2-2 shows the extent of flooding that a 1-percent tidal flood event will have on the FMP project area (located east of the Guadalupe River, west of the Coyote Creek, and north of State Route 237) mapped by FEMA.

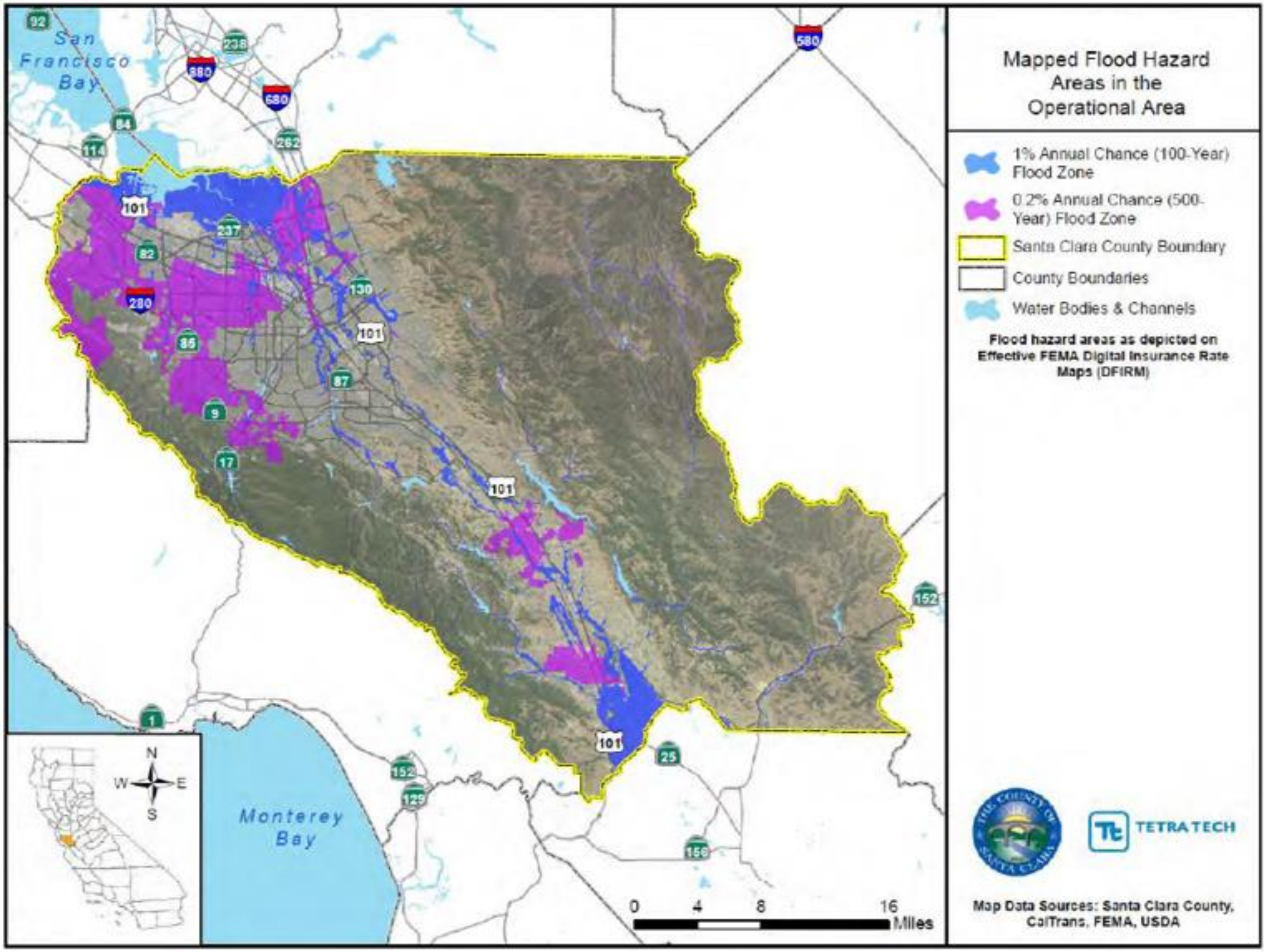
Mapped Flood Hazard Areas in the Operational Area
1% Annual Chance (100-Year) Flood Zone
0.2% Annual Chance (500-Year) Flood Zone
Santa Clara County Boundary
County Boundaries
Water Bodies & Channels
Flood hazard areas as depicted on Effective FEMA Digital Insurance Rate Maps (DFIRM)
Map Data Sources: Santa Clara County, CalTrans, FEMA, USDA
TETRA TECH
San Francisco Bay
Monterey Bay
N
W
E
S
92
238
880
680
580
84
114
262
101
237
82
280
130
85
87
9
17
152
1
25
129
156
0 4 8 16
Miles

FIGURE 5.2-1
Mapped Flood Hazard Area in Santa Clara County

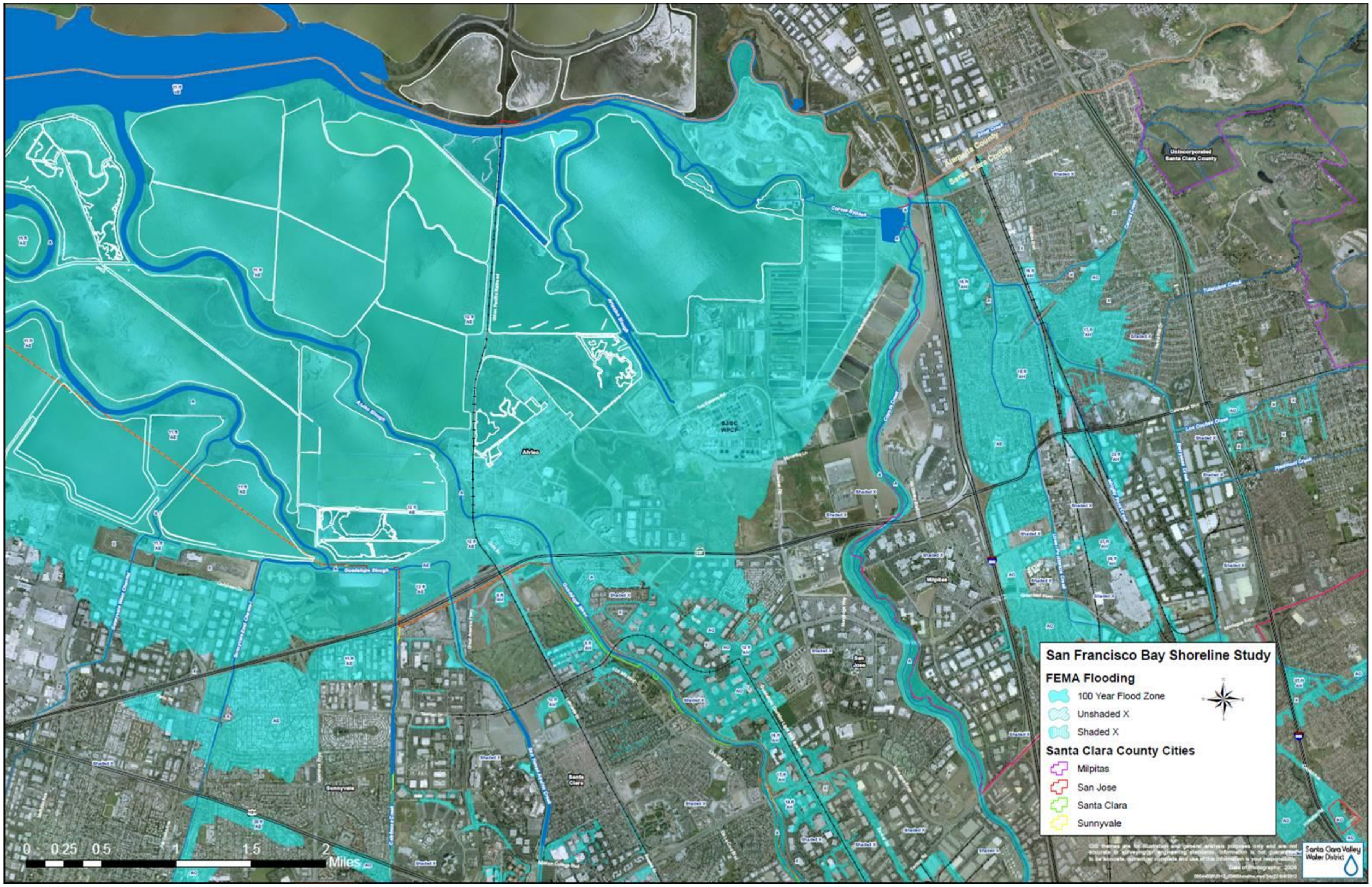

FIGURE 5.2-2
FEMA 1% Tidal Flooding in North San Jose Shoreline (Alviso)

Historical subsidence in the project area due to past overdraft of groundwater has left some land areas such as the community of Alviso, as well as most of the former salt ponds, below sea level. Extensive additional areas are below the annual high tide elevation. These low-lying areas are protected from tidal flooding under normal circumstances by former salt pond dikes. Within the project area, there are currently no areas of natural high ground adjacent to tidal waters. Future increases in relative sea level are expected to increase the frequency with which unusually high tidal water levels can cause tidal flooding in the project area (Shoreline Feasibility Study, 2015).

Diking of the former salt ponds isolated the ponds from the supply of sediment in the South Bay. Consequently, subsidence has not been countered by sediment deposition in the ponds, resulting in relatively low pond-bottom elevations compared to the adjacent marsh areas just outside of the outboard dikes where sediment supply has kept up with subsidence. These lower elevations within the former salt ponds do not offer significant attenuation of flood levels for a condition when the outboard dike protection fails. Flooding threats to the low-lying sub-basins; landward of the shoreline and former salt ponds and between each creek levee system are dependent on the properties of the pond dikes and the topography within the former salt ponds. The project area is particularly vulnerable because of especially low elevations in the flood basin (Guadalupe River/Alviso Slough to Coyote Creek) (Shoreline Feasibility Study, 2015).

There is a weak but not insignificant correlation between tidal residual surge (additional water elevation above the astronomical tidal elevation due to the meteorological condition) and stream/river runoff, due to their common meteorological dependence. Although the creeks are leveed, significant combinations of tidal flood levels and creek/river discharges can result in flow over the creek/river levees directly into the tidal flood basins. This added water volume can aggravate the tidal flooding threat and vice versa (Shoreline Feasibility Study, 2015).

The impact of the added creek flow on the tidal flooding impact is dependent on the timing of the delivery of the creek flow volume relative to the coastal flood and the relative impacts of the individual events alone as well as whether the tidal flooding is tail water controlled or not (Shoreline Feasibility Study, 2015).

5.3 FLOOD INSURANCE RATE MAPS AND THE COMMUNITY OF ALVISO

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most participating communities, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance (100-year) flood and the 0.2-percent annual chance (500-year) flood. Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. In recent years, FIRMs have been digitized and renamed Digital Flood Insurance Rate Maps (DFIRM). This change renders the documents more accessible to residents, local governments and stakeholders (SCCOAHMP, 2017).

Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure that three criteria are met:

- New buildings and those undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not aggravate existing flood problems or increase damage to other properties.

FIRMs are the mapped product of engineering studies, called Flood Insurance Studies (FISs). The effective date of the first FIS for the City of San José was August 2, 1982. Since that time, the FIS for the City of San José has been updated multiple times, the most recent revision being February 19, 2014 (SCCOAHMP, 2017).

The City of San José is in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. All planning partners that participate in the NFIP have identified actions to maintain compliance and good standing (SCCOAHMP, 2017).

5.4 VULNERABLE STRUCTURES

The coastal floodplain includes all of the community of Alviso as well as dozens of homes and businesses further inland. The community of Alviso is at an elevation of approximately 4 feet (NAVD 88), which is just above the mean sea level of about 3.7 feet (NAVD 88). The properties in the project area are at an elevation of between 1 and 14 feet (NAVD 88) (not accounting for elevated finished floors), with approximately one quarter of them being less than 4 feet (NAVD 88) above sea level. The increasing future coastal flood risk poses a threat to the safety and health of the residents in the area. According to the coastal flood modeling performed by the USACE for the South San Francisco Bay Shoreline Feasibility Study, depending on the Sea Level Change (SLC) scenario, flood depths within the community of Alviso could be as high as 7 to 10 feet (NAVD 88) within the fifty-year period of analysis (Shoreline Feasibility Study, 2015).

The risk analysis for the flood damage study performed by the USACE for the Shoreline Feasibility Study was completed in accordance with the USACE Flood Risk Management National Economic Development (National Economic Development) Manual (Engineering Regulation, ER1105-2-101). The ER1105-2-101 requires the USCAE to consider a full range of flood events (50%, 20%, 10%, 4%, 2%, 1%, 0.4% and 0.2% ACE events) in the formulation and evaluation of the project alternatives to determine the damages caused by the flood events. The USACE evaluated a full range of flood events in the Shoreline Feasibility Study to (1) identify the National Economic Development (NED) plan as the flood damage reduction alternative that reasonably maximizes expected net benefits; and (2) display the flood protection performance and distribution of residual flood damage. The USACE is required to fully describe the 0.2% ACE flood event with and without the project in the Shoreline Feasibility Study. The USACE's Shoreline Feasibility Study contains, two-tenths of 1 percent flood damages;

the number of people and towns affected; the number of structures and acres by land-use type; disruption of essential services and distance to unaffected essential services; anticipated warning time; flood depths, velocity, duration, debris content, and other indicators pertinent to catastrophic flooding.

The approximate population at risk (PAR) is 5,500. PAR is a broader measure of risk than just those residing in the floodplain; it includes the number of people working in the area that are at risk of being adversely impacted by a flood event. The number of people estimated to be working in the floodplain is 3,400 and the number of residents in the floodplain is 2,100. The total PAR may be overstated to a degree since it is unlikely that this entire population would be within the floodplain during a given flood event. However, the PAR estimate does not include those persons traveling through the study area, which would at least partially offset any such overestimation (Shoreline Feasibility Study, 2015).

The project area is dominated by residential structures (see Table 5.4-1: Structure Types in 0.2% Annual Chance of Exceedance (ACE) Floodplain). The 0.2% ACE floodplain under the USACE High SLC scenario has approximately 1,100 structures, of which the vast majority is residential. The USACE 0.2% ACE event is equivalent to FEMA's 0.2% Annual Chance Flood event, both are referring to a 500-year flood event. Information in this report that is referenced from USACE will use the ACE designation and information referenced from FEMA will use the Annual Chance Flood designation. There are several manufactured and mobile home parks, and several business parks with large commercial and industrial properties. The floodplain contains a school, several churches, a fire station (the structure is elevated out of the floodplain), critical infrastructure such as State Route 237 and the Wastewater Facility, and a wide range of commercial and industrial buildings – including many high technology and Information Technology (IT) companies. Cisco Systems, Inc. is the most well-known company located in the floodplain; their worldwide headquarters is located across State Route 237 in the project area (Shoreline Feasibility Study, 2015).

TABLE 5.4-1
Structure Types in 0.2% Ace Floodplain

Residential	Commercial	Industrial	Public	Total
1034	54	42	9	1140

5.5 LOSS ESTIMATES

The flood plain structural inventory value is estimated to be $465 million. Engineering and economic modeling performed by the USACE in the South San Francisco Bay Shoreline Project Feasibility Study indicated that there is currently a significant threat of major tidal flooding throughout the Alviso community, and this threat is projected to increase significantly over time because of SLC. Currently, the only infrastructure protecting the community of Alviso from widespread economic damages, as well as threats to life and safety, is a non-engineered system of dikes and ponds that USACE engineering analysis indicates have a high likelihood of failure over the period of analysis. Alviso is at an elevation at or below an elevation of 5 feet (NAVD 88), which is lower than mean high tides in the area. Because of its low elevation, a coastal flood could result in water depths as great as 8 feet (NAVD 88) throughout much of the floodplain. Floods that would result in several feet of flooding in Alviso are estimated to cause more than $100 million in direct damage to structures and contents (Shoreline Feasibility Study, 2015).

Per USACE’s coastal flood risk analysis, there is an expected high annual risk of flooding, and this risk will increase over the period of analysis under the USACE SLC scenario. This increase is due to the increase in relative sea level at the study location over the period of analysis. The increasing likelihood of future coastal flooding in the area also threatens the Wastewater Facility, which is a critical regional facility. The plant serves approximately 154 million people and a large portion of businesses in Silicon Valley. A flood causing inundation of the underground equipment is estimated to cause more than $200 million in direct damage. The Wastewater Facility is not in the current coastal floodplains developed by USACE, but it is in the future floodplains that incorporates the USACE SLC projections (Shoreline Feasibility Study, 2015).

If the flooding were severe enough to damage an unprotected Wastewater Facility, the potential release of raw sewage into the bay and the loss of service would have catastrophic impacts on the region. In the long-term, the increasing frequency of floods would likely force people to relocate out of the floodplain, and the community of Alviso would either be significantly adversely affected or cease to exist altogether. The relocation of structures out of the area would be expected to include an elementary school, several churches, and potentially the San José Fire Department Station #25 (Shoreline Feasibility Study, 2015).

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6. PREVENTION MEASURES

Preventive activities keep flood problems from getting worse. The use and development of flood prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and code enforcement, and include:

- General Planning
- Building Codes
- Zoning
- Floodplain regulations
- Subdivision regulations
- Stormwater management

The following subsections discuss the current and future prevention measures that aim to keep flooding problems from getting worse within the FMP project area.

6.1 CURRENT PREVENTION MEASURES

6.1.1 General Plan

The following paragraphs summarize the land-use plans of the City of San José. In addition to land-use goals and policies, most general plans include goals and policies related to flooding, floodplain development, flood risk management, biological resources, and recreation.

6.1.1.2 City of San José General Plan

Most of the FMP project area is within North San José, and the only residential area in the study area is in the community of Alviso. On November 1, 2011, the San Jose City Council adopted a comprehensive General Plan update to its previous 2020 General Plan. This new plan, called the Envision San Jose 2040 General Plan, became effective on December 1, 2011 (City of San José 2011). The General Plan identifies several planning areas, including one for the Alviso area.

The General Plan includes 12 major strategies that are addressed through goals, policies, and actions. The major strategies address the following:

- Community-based planning
- Form-based plan
- Focused growth
- Innovation and regional employment
- Urban villages
- Streetscapes for people
- Measurable sustainability and environmental stewardship
- Fiscally strong city
- Destination downtown

- Life amidst abundant natural resources
- Design for a healthful community
- Phasing and periodic review

Plan goals, policies, and actions to achieve objectives are as follows:

Land use and employment: includes items that address cultural attractions (including open space such as that associated with the study area; Goal IE-5).

Measurable environmental sustainability: includes items that address construction- related air emissions (Goal MS-13) and water quality (Goal MS-20).

Environmental resources: includes items that address riparian corridors (such as Coyote Creek; Goal ER-2), the bay and baylands (Goal ER-3), special-status plants and animals (Goal ER-4), migratory birds (Goal ER-5), urban-natural interface (Goal ER-6), wildlife movement (Goal ER-7), water resources (Goal ER-9), and archaeology and paleontology (Goal ER-10).

Environmental considerations and hazards: includes items that address noise and vibration (Goals EC-1 and EC-2) and flooding hazards (Goal EC-5).

Parks, open space, and recreation: includes items that address sustainable parks and recreation (Goal PR-6) and interconnected systems (Goal PR-7).

Land use: includes items that address growth areas (Goal LU-2), historic landmarks and districts (Goal LU-13), historic structures of lesser significance (Goal LU-14), public awareness of historic resources (Goal LU-15), compatibility between historic preservation and sustainability (Goal LU-16), and urban growth boundary (Goal LU-19).

Transportation: includes items that address walking and bicycling (Goal TR-2).

Trail network: includes items that address trails as transportation (Goal TN-2) and accessible, safe, and well-functioning trails (Goal TN-3).

Plan implementation: includes items that address plan implementation by other agencies (Goal IP-16).

6.1.1.3 Alviso Master Plan

The Alviso Master Plan was adopted in 1998 but was amended with the City's new land-use plan adopted as part of the City's 2040 General Plan. The City still uses the principles of the 1998 plan to guide development in the Alviso area. As described in the 2040 General Plan, the expanded job growth capacity is in the area west of the Wastewater

Facility along the State Route 237 corridor. The 1998 plan shows the same general types of uses in the area, so the update did not change the focus from the 1998 plan. The Alviso area land-use principles remain unchanged; these principles focus on maintaining community character and making sure new uses are carefully integrated into the existing community. Like the 2040 general plan policies for environmental protection and resource management, the community plan policies recognize the importance of intact riparian areas and the effects of tidal flooding.

The Alviso plan objectives do not include establishing new flood risk management features but rather encourage uses that are compatible with the existing environment. The 1998 Master Plan specifically states an assumption that USACE will not provide flood risk management measures in the future. This assumption has influenced ongoing and future development plans, including those reflected in the 2040 General Plan. In spite of the flood risk management levee proposed as part of the Shoreline Phase 1 Project, the Alviso and San Jose plans continue to reflect development patterns that would be suitable without additional tidal flood risk management.

In summary, the planned development patterns reflect an assumption that new tidal flood risk management features will not be constructed and thus would not provide flood risk management that would induce growth beyond that currently planned.

6.1.2 Building Code and Zoning Requirements

Building codes are laws, ordinances, or governmental regulations that set forth standards and requirements for the construction, maintenance, operation, occupancy, use or appearance of buildings, premises, and dwelling units.

One way to require non-conforming structures to come up to code is to establish passive or active code triggers, such as a change in use. In order to qualify for a change in use, the building must meet or approach current code. A different kind of code trigger requires that buildings that have suffered a certain degree of damage be renovated to a higher level of natural hazards resilience. Another approach to code enforcement is to establish financial incentive or voluntary compliance programs.

6.1.2.1 Current Practices in the City of San José

The City of San José currently enforces the standards set forth in the 2019 California Building Code (Title 24 of the California Administrative Code), the City of San José Zoning Ordinance, and enforces policies that set forth the construction standards within special flood hazard zones

A building permit is required to construct, enlarge, alter, repair, move, improve, remove, convert, or demolish a building or structure. Permits are also required for plumbing, electrical and mechanical work. If a property is in a FEMA mapped Special Flood Hazard Area, Department of Public Works (DPW) approval is required before a building permit can be issued.

6.1.3 Zoning

A zoning ordinance regulates development and existing uses by dividing the community into zones or districts and setting development criteria for each district. The floodplain can be designated as one or more separate zoning districts that prohibit development or allow only development that is not susceptible to damage by flooding. For example, new commercial development can reasonably be precluded or dissuaded from hazardous areas in the interest of protecting these major contributors to the tax base.

Appropriate zoning districts include public use, conservation, and cluster or planned unit developments that keep buildings out of the floodplain, wetlands, and other areas that are not suitable for intensive development.

6.1.3.1 Current Practices in the City of San José

The City of San José has adopted the County of Santa Clara's Zoning Ordinance as part of Ordinance No. 28512, Chapter 17.08 of Title 17 of the San Jose Municipal Code Special Flood Hazard Regulations. The City of San José's Special Flood Hazard Regulations outlines the development criteria for new development and or substantial improvement projects within the designated flood zones (Zone A, AO, A1-A30, AE, A99, AH, V1-V30, VE or V). A description of the County of Santa Clara's Zoning Ordnance and the City of San José's Special Flood Hazard Regulations is presented in section 6.1.4.

6.1.4 Floodplain Construction Standards

Zoning and open space preservation work to keep damage-prone development out of hazardous or sensitive areas. Building construction and special use regulations impose construction standards on what is allowed to be built in the floodplain.

The NFIP operates through a partnership between the Federal Government, the states, and individual communities. Participation in the NFIP is voluntary. In participating communities, affordable, federally backed flood insurance is made available to property owners and renters. In return, each community adopts and enforces a floodplain management ordinance or law, which it uses to define regulatory floodplains and control floodplain development, including new construction, substantial improvement of existing buildings, and repairs of substantially damaged buildings.

FEMA's NFIP sets minimum requirements for participating communities' building construction regulations. The NFIP minimum requirements are summarized in Table 6.1-1.

6.1.4.1 Current Practice in Santa Clara County

The Legislature of the State of California has in Government Code Sections 65302, 65560, and 65800 conferred upon local governmental the authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. These sections serve as the authority for the adoption of the Flood Damage Prevention Ordinance. Santa Clara County's ordinance meets the minimum NFIP requirements spelled out in Table 6.1-1.

Santa Clara County Ordinance Code Chapter VII of Division C12, Floodplain Management, became part of the Santa Clara County Ordinance Code, when Santa Clara County adopted ordinance no. NS 1110.106, which amended Chapter VII. As a requirement for continued participation in the NFIP, Santa Clara County Ordinance Code Chapter VII was amended in April 2009. The update included new definitions and standards outlined in Title 44 of the Code of Federal Regulations.

Santa Clara County Ordinance Code Chapter VII, Floodplain Management promotes public health, safety, and general welfare, and minimizes public and private losses due to flood conditions in specific areas by provisions designed to:

- protect human life and health;
- minimize expenditure of public money for costly flood-control projects;
- minimize the need for rescue and relief efforts associated with flooding;
- minimize prolonged business interruptions;
- minimize damage to public facilities and utilities located in SFHAs;
- help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future blight areas;
- ensure that potential buyers are notified that property is in an area of special flood hazard; and
- ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

TABLE 6.1-1
Minimum Regulatory Requirements Imposed by Communities Participating in the NFIP

Newly Constructed, Substantially Damaged, and Substantially Improved Buildings in the SFHA:

- Building sites must be reasonably safe from flooding.
- Buildings must be:
  - Designed (or modified) and anchored to prevent flotation, collapse, and lateral movement of the building resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy,
  - Constructed with materials resistant to damage from immersion in flood waters,
  - Constructed with methods and practices that minimize flood damage, and
  - Constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent flood water from entering or accumulating within their components.

Subdivisions and Other New Development in the SFHA:

- All proposals for subdivisions and other new development in the SFHA must be consistent with the need to minimize flood damage within the flood-prone area.
- All public utilities and facilities must be located and constructed to minimize or eliminate flood damage.
- Adequate drainage must be provided for all such subdivisions and new developments in order to reduce exposure to flood hazards.

Additional Minimum Requirements for Buildings in A Zones:

Building Elevation in Zones AE and A1-A30**.** The top of the lowest floor, including the basement floor, of all newly constructed, substantially damaged, and substantially improved buildings must be at or above the BFE.

Enclosures Below the Lowest Floor in Zones AE, A1-A30, AO, and A**.** Enclosed space below the lowest floors of newly constructed, substantially damaged, and substantially improved buildings may be used only for parking of vehicles, access to the building, or storage. The walls of such areas must be equipped with openings designed to allow the automatic entry and exit of flood waters.

Additional Minimum Requirements for Buildings in V Zones:

The additional minimum requirements regarding newly constructed, substantially damaged, and substantially improved buildings in Zones VE, V1-V30, and V pertain to **Siting:** All newly constructed buildings must be located landward of the reach of mean high tide. **Building Elevation:** All newly constructed, substantially damaged, and substantially improved buildings must be elevated on pilings, posts, piers, or columns so that the bottom of the lowest horizontal structural member of the lowest floor is at or above the BFE. **Foundation Design:** A registered engineer or architect must develop or review the structural design, construction specifications, and plans for construction and must certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the building elevation and foundation design standards described above. **Use of Fill:** Fill may not be used for the structural support of any building within Zones VE, V1- V30, and V.

6.1.5 Subdivision Regulations

Subdivision regulations govern the division of land for development or sale. In addition to controlling the configuration of parcels, they set standards for developer-built infrastructure. Many communities include developer exactions and impact fees/system development charges in their subdivision regulations.

Subdivision regulations can be used for mitigation purposes in several ways. When hazard zones can be identified on a map of the parcel, communities may require minimum distances between those zones and development. If land dedications are required as part of the subdivision regulation, they can be used to reserve hazard-prone land for non-intensive uses.

Subdivision regulations may also set a standard for public infrastructure that ensures it is adequate for the assessed risk. For example, the installation of adequate drainage and stormwater management facilities should be required in flood-prone areas. If local governments are responsible for management of developer-built infrastructure, they should require that all improvements be built to hazard-resilient standards. This may help reduce the public cost of post-disaster reconstruction.

Subdivision regulations can require that developments be built in a hazard-resilient manner. In order to reduce fire risk, for example, subdivision ordinances may require wide building spacing, fire breaks, on-site water storage, and multiple access points. They should require “deep” lots in shorefront areas. These lots allow homes to be moved inland on the same parcel in the case of shoreline erosion.

The site plan review stage is another time at which it is possible to require developers to site buildings away from hazard-prone portions of the area. Local governments may require mitigation actions, such as the protection or creation of wetlands, dunes or natural vegetation, as a condition of subdivision approval.

Some experts recommend establishing land use restrictions for each property before it is subdivided. After a property is subdivided, the various owners may demand compensation for the loss of use of their property. As a result, the local jurisdiction might have to acquire land that it could have otherwise regulated without a purchase.

Subdivision regulations are not as broad as zoning and only indirectly affect the quality and type of development that occurs on subdivided land. Since these regulations apply only when land is subdivided and sold, they do not address development of small or undivided parcels of land.

6.1.5.1 Current Practice in the City of San José

The City of San José Subdivision Ordinance establishes procedures and rules to provide for the timely provision of required streets, utilities and stormwater management facilities; and for the separation of buildings for fire safety and open space.

The Subdivision Ordinance requires that all tentative maps contain the location of potentially dangerous areas within and adjacent to the proposed subdivision, including areas subject to stormwater overflow, inundation, flood hazard or geological hazard, the location, width and direction of flow of all watercourses and flood-control channels, the location of culverts, and all natural or man-made drainage devices within and adjacent to the proposed subdivision.

The director may disapprove a tentative map because of design, flood hazard, inundation, lack of adequate access, lack of adequate water supply or fire protection, insufficient sewage or drainage facilities, geological hazards, when the only practical use which can be made of the property thereon is a use prohibited by any ordinance, statute, law or other valid regulation, or because of failure to comply with the requirements of the Subdivision Map Act or of Title 19.

6.1.6 Stormwater Management and Urban Runoff Regulations

The City of San José established specific requirements, under City Policy 6-29, to minimize and treat stormwater runoff from new development and redevelopment projects, consistent with the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (or “MRP”). The protection of local streams from pollution and high volumes of stormwater runoff contributes to the City’s sustainability goals by ensuring good water quality, enhancing the beneficial use of local waterways, and enhancing the quality of wildlife habit (City of San José Website, 2020).

The Federal Clean Water Act requires the City of San José to operate under a Municipal Stormwater NPDES Permit for the discharge of stormwater via the City’s stormwater collection system. On October 14, 2009, the Regional Water Quality Control Board adopted the Municipal Regional Stormwater NPDES Permit (Permit Number CAS612008) for the San Francisco Bay Region. In an effort to standardize stormwater management requirements throughout the nine-county region, this permit replaces the formerly separate countywide municipal stormwater permits with a regional permit for 76 Bay Area municipalities, including the City of San José (City of San José Website, 2020).

The MRP requires use of Low Impact Development (LID) techniques including infiltration, harvest and reuse, evapotranspiration, or biotreatment to manage stormwater. The objective of LID is to maintain predevelopment rates of infiltration, evaporation, and runoff from the property being developed (City of San José Website, 2020).

6.2 PROPOSED PREVENTION MEASURES

The current programs and regulations do not address all of the issues that can cause property losses and business interruption. These additional measures address some of the remaining property loss issues.

6.2.1 Design/Regulatory Flood Elevation (Freeboard)

The NFIP requires "all new construction and substantial improvements of residential structures within AE zones on the community's FIRM, have the lowest floor (including the basement) elevated to or above the base (1% annual chance) flood level" (44 CFR 60.3I(2)). Within riverine special flood hazard areas, commercial structures may be floodproofed in lieu of elevation. Santa Clara County and the City of San José require new construction and substantial improvement of all structures to have the reference floor elevation at or above the 1% annual chance flood elevation. Elevating above the regulatory flood elevation is known as "freeboard." This freeboard is a buffer zone to provide added protection for the structure to help prevent the entrance of floodwaters during a flood event.

The amount of freeboard a community adopts depends on local considerations. Factors that may contribute to the selection of freeboard include the desired level of additional protection, the potential rise due to future development, how sensitive the flood level is to changes in flow, the amount of insurance rate reduction that is available through the NFIP's CRS program, and economic impacts on development. Another major deciding factor may be development height limitations within a community.

Some structures that are built to the minimum NFIP standards will be partially inundated during a 1% annual chance flood. With the reference floor elevated at the Base Flood Elevation (BFE), floodwater will be literally at door level under ideal conditions during a base flood. Any conditions that could increase flood levels such as debris accumulation at bridges and culverts, or channel sedimentation will cause further flood damage of the structure. The impervious surface areas added by new development increases runoff, possibly causing structures to be flooded even though they were constructed in compliance with minimum NFIP standards.

The City of San José's Municipal Code Special Flood Hazard Regulations specify that the elevation of the lowest floor in Special Flood Hazard Area Zone AO shall be elevated to or above the depth number specified on the FIRM. If there is no depth number on the FIRM, the lowest floor, including basement, shall be elevated two (2) feet above the highest adjacent grade. The elevation of the lowest floor in Special Flood Hazard Area Zones A, A1-A30, AE or AH shall be elevated to or above the base flood elevation specified on the FIRM or the best available data as defined in Section 17.08.210 of the Municipal Code when base flood elevation has not been provided.

6.2.2 Critical Facilities Regulations

For some activities and facilities, even a slight chance of flooding is too great a threat. Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be located in a floodplain if at all possible. If a critical facility must be located in a floodplain it should be provided a higher level of protection so that it can continue to function and provide services after the flood. Communities should develop emergency plans to continue to provide these services during the flood (FEMA Website, 2020).

Under Executive Order 11988, Floodplain Management, Federal agencies funding and/or permitting critical facilities are required to avoid the 0.2 percent (500-year) floodplain or protect the facilities to the 0.2 percent chance flood level (FEMA, Website 2020).

The NFIP regulations only require elevation of structures located in SFHAs to the BFE, regardless of the function they serve (NFIP CRS Coordinator's Manual, 2017). Facilities belonging to agencies of the Federal Government are subject to Executive Order 11988, which requires rigorous alternative site evaluations before funding, leasing, or building any facility in the 1% annual chance (100-year) floodplain. The guidelines for implementing Executive Order 11988 set the 0.2 % annual chance (500-year) flood as the standard for protecting "critical actions."

Many public and commercial facilities serve vital functions for communities, which, if interrupted due to flooding, would severely impact citizens. Also, some facilities house large numbers of people who would experience difficulty if required to evacuate before or during a severe flood. Special consideration should be given to requiring a higher level of protection from flooding for such facilities. Since flooding can prevent access to a critical facility even if the facility is elevated or floodproofed above the flood level, primary consideration should be given to locating critical facilities where the risk of flooding is minimal.

Statistically, a facility located in a SFHA stands a 26% chance of experiencing the 1% annual chance (100-year) flood in a 30-year period. On the other hand, a facility located outside a 0.2% annual chance (500-year) floodplain (i.e., in a C Zone or "unshaded X Zone" as shown on the FIRM) stands less than a 6% chance of being flooded over a 30-year period (NFIP CRS Coordinator's Manual, 2017).

The critical facilities identified in the project area include State Route 237 and the Wastewater Facility.

7. PROPERTY PROTECTION

Property protection measures are used to modify buildings or other facilities subject to flood damage rather than to keep floodwaters away. Often, they are implemented by (or cost-shared with) property owners. There are a variety of flood protection measures that can be implemented by the local jurisdiction to protect individual buildings from flooding, as discussed in the sections below:

- Building Elevation
- Floodproofing

7.1 BUILDING ELEVATION

Raising a house above the flood level is the best property protection method short of getting the building entirely out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents. Another alternative is to raise the building and place fill under it before the building is lowered back down, although sometimes buildings on fill look safe and people may feel encouraged to stay in them during a flood. Placement of fill however can create cumulative impacts to the flood plain, particularly in large, flat floodplains such as Alviso.

Elevating a structure will change its appearance. If the house is raised two feet, the front door would be three steps higher than before. If the house is raised eight feet, codes will usually allow the lower area to be wet floodproofed for use as a garage and for limited storage of items not subject to flood damage.

Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. When the property owner wants to stay in the floodplain, this protection technique is required by law for new and substantially damaged residences if the lowest floor is below the base flood elevation. Building elevation is commonly practiced in flood-prone areas nationwide, and house-moving contractors know the necessary techniques (2018 IBC Flood Resistant Provisions, 2017).

FEMA has developed a set of criteria that may be used to evaluate whether a building can be elevated. The building must be accessible below the first floor for placement of jacks and beams, it must be light enough to be lifted, and it must be strong enough to survive the elevation process. Elevation of a building increases its vulnerability to high winds and earthquakes. Thus, there is a need to incorporate wind and seismic protection measures to ensure that the flood protection project does not increase the building's vulnerability to other hazards.

Elevation is one of the best techniques for protecting buildings that are, or for some reason must be, located in areas prone to flooding. Elevation is cheaper than relocation and is less disruptive to the neighborhood.

7.2 FLOODPROOFING

If a building cannot be removed from harm's way, it can be protected on site. In areas of low flood threat, such as infrequent shallow flooding, barriers, and dry and wet floodproofing, can be efficient approaches. These approaches can also be less disruptive to a neighborhood. However, floodproofing a residential building does not qualify for an insurance premium reduction and is not allowed if the project is a substantial improvement or repair of substantial damage.

Dry floodproofing: Through dry floodproofing, a building on a slab foundation is sealed against floodwaters. All areas below the flood protection level are made watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings, such as doors, windows, sewer lines, and vents, are closed, either permanently with removable shields or with sandbags.

The flood protection level should be no more than 2 or 3 feet above the top of the slab because the building's walls and floors may not withstand the pressure of deeper water. If a nonresidential building is dry floodproofed to one foot above the base flood elevation, there is a flood insurance rate reduction (IBC Flood Resistant Provisions, 2018).

Wet floodproofing: This term means intentionally letting floodwaters into an area, but modifying the area to eliminate or minimize water damage. Wet floodproofing techniques can be as simple as moving a few valuable items or as involved as rebuilding the floodable area. This is the preferred approach for crawlspaces and garages. If damageable items, such as furnaces, air conditioning units, and ductwork, are removed or elevated above the flood level, a crawlspace can be flooded and be damage free. For other areas, wet floodproofing is usually considered a measure of last resort, because the modifications needed severely limit use of an inhabited area (2018 IBC Flood Resistant Provisions, 2017).

Barriers or dry floodproofing are more appropriate for buildings on slab foundations subject to shallow flooding and local drainage problems. There are several residential and commercial buildings in the project area that could benefit from these approaches. However, for this approach to be effective the property owners must receive adequate warning of an upcoming flood event.

Floodproofed buildings in the flood zone are still subject to damage from floating debris and may not provide shelter during flood events. Floodproofing a residential building does not qualify for an insurance premium reduction.

Dry floodproofing cannot extend more than two or three feet above the foundation of the building because the pressure exerted by deeper water would collapse most walls and floors (2018 IBC Flood Resistant Provisions, 2017).It must be remembered that during a flood, the building may be isolated and without utilities, and, therefore, unusable. The streets, utilities, and other infrastructure that serve the property will still be exposed to flood damage. This is also a risk to the occupants who may try to get in and out of the building during a flood.

Although floodproofing raises construction retrofit costs, it is an effective mitigation tool and provides a high level of protection from water damage. Simply moving utilities, contents, and electrical appliances out of the flood-prone area can prevent thousands of dollars in damage.

8. NATURAL RESOURCE PROTECTION

Preserving or restoring natural areas or the natural functions of floodplain and watershed areas produces flood loss reduction benefits as well as improves water quality and habitats. These activities are implemented by the local jurisdiction, the City of San José. The natural resource protection measures discussed in the sections below are:

- Wetland protection
- Erosion/sediment control and Best management practices

8.1 WETLANDS PROTECTION

Wetlands are often found in floodplains or depression areas in the watershed. Many can store large amounts of floodwaters, slowing and reducing downstream flows. They also filter water and provide habitats for fish and wildlife. Most development projects in wetlands are regulated by the USACE under Section 404 of the Clean Water Act. USACE “404” permits are required for projects that will place fill or dredged materials in a wetland. Before a permit is issued, the plans are reviewed by several agencies, including the USFWS and the United States Environmental Protection Agency. In addition, the San Francisco Bay Conservation and Development Commission and California State Lands Commission regulate and protect the wetlands located within the FMP project area.

Generally, these agencies want to protect wetlands by preventing development that will adversely affect them. However, sometimes the negative impact can be mitigated by preserving or developing an equivalent or larger wetland on another site, although it takes many years for a new wetland to approach the same quality as an existing one and many never do. Another drawback is that a new wetland in a different location (especially if it is in a different drainage basin) will not have the same flood protection benefits as the original one did.

8.1.1 South Bay Salt Pond Restoration Project

The South Bay Salt Pond (SBSP) Restoration Project is a collaborative effort among the Coastal Conservancy, USFWS, USACE, Valley Water and other agencies working with scientists and the public to develop a programmatic plan for habitat restoration, flood management, and wildlife-oriented public access within the approximately 15,100 acres of former Cargill salt ponds in South San Francisco Bay (Shoreline Feasibility Study, 2015).

The SBSP Restoration Project is the largest tidal wetland restoration project on the West Coast. When complete, the project will restore 15,100 acres of industrial salt ponds to a rich mosaic of tidal wetlands and other habitats (Shoreline Feasibility Study, 2015).

The SBSP Restoration Project is providing critical new habitat for fish, birds and other wildlife, transforming a landscape the size of Manhattan into a thriving wetland ecosystem. Salt marsh, mud flats and sloughs provide shelter for endangered wildlife such as the salt marsh harvest mouse and Ridgway’s rail;

rich feeding grounds for shorebirds; and nursery areas for young fish such as leopard sharks and steelhead. The SBSP Restoration Project calls for turning at least 50%, and potentially as much as 90%, of the project’s 15,100 acres into tidal marsh over the next few decades. The South Bay Salt Pond Managers won’t restore more than about 50% of the acreage unless it can be done without significant impacts to birds that depend upon the existing salt ponds (Shoreline Feasibility Study, 2015).

SBSP Restoration Project Phase I construction started in 2008, the final SBSP Restoration Project Phase I restoration actions were initiated in 2011 at Alviso Complex Ponds A16 and A17 and were completed in 2013 (Shoreline Feasibility Study, 2015). In 2019 construction began on SBSP Restoration Project Phase 2 at the Ravenswood Pond Complex. The project will restore and enhance over 2,000 acres of tidal wetlands and managed pond habitats in South San Francisco Bay while providing for flood management and wildlife-oriented public access and recreation.

8.1.2 South San Francisco Bay Shoreline Phase 1 Project

The Shoreline Phase 1 Project is a partnership with the USACE, Coastal Conservancy, USFWS, and Valley Water to provide tidal flood protection, restore and enhance tidal marsh and related habitats, and provide recreational and public access opportunities. The project partners signed the project partnership agreement for construction of the EIA 11 Shoreline Phase 1 Project on February 14, 2019, for the urban area of North San José and the community of Alviso. Both the SBSP Restoration Project and the South San Francisco Bay Shoreline Project are being closely coordinated.

The Shoreline Phase 1 Project would create approximately 2,900 acres of tidal marsh habitat and ecotone, thereby restoring ecological structure and function, and connectivity to a habitat type that has experienced close to a 90 percent loss in the San Francisco Bay area. The restored habitat would also benefit special-status species such as the California-endemic salt marsh harvest mouse and Ridgway’s rail, which reside almost exclusively on tidal marsh habitat (Shoreline Feasibility Study, 2015). The Shoreline Phase 1 Project includes an ecotone transitional habitat feature, which would be constructed bay-ward to the proposed FRM levee along Ponds A12, A13, and A18 (as shown in Figure 8.1-1, Figure 8.1-1 also shows the FRM features of the Shoreline Phase 1 Project described in Section 9.1.1). Currently in San Francisco Bay, wetland-upland transition zones have largely disappeared from marshes. These features mimic the natural landform that once existed around the perimeter of San Francisco Bay and provide the functions of a distinct habitat that is now largely absent along southern San Francisco Bay. These habitat areas serve as high-tide refugia for State- and Federally-listed threatened and endangered species, such as Ridgway’s rail, black rail, and salt marsh harvest mouse and also provide habitat for a unique suite of plant species. Adding this feature bay-ward of the levees would benefit the recovery of protected wetland species and help restore ecological functions (Shoreline Feasibility Study, 2015).

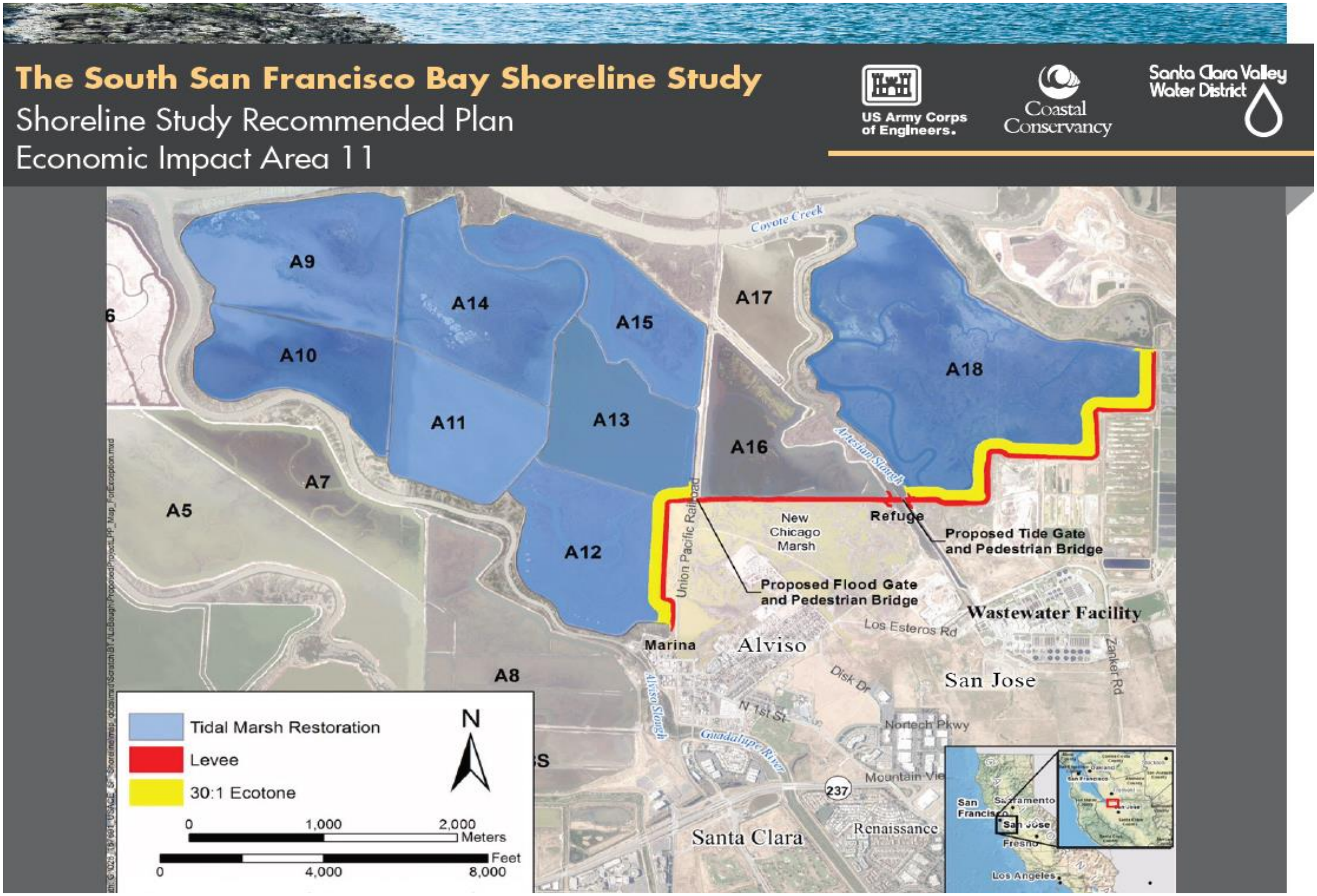


FIGURE 8.1-1
Shoreline Phase 1 Project:
Tidal Marsh Restoration, FRM Levee, Ecotone Habitat

8.2 EROSION/SEDIMENT CONTROL AND BEST MANAGEMENT PRACTICES

Due to the bare nature of construction sites, stormwater runoff can erode soil, sending sediment into downstream waterways. Sediment tends to settle where a river or stream slows down, such as when it enters a lake. Sedimentation will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters. This affects channel capacity and the sediment in the water reduces light, oxygen and water quality, which affects water supply treatment, habitat and fishing.

8.2.1 State of California Requirements

Construction and/or demolition projects in City of San José causing land disturbances that are equal to one acre or greater must comply with State requirements that control the discharge of stormwater pollutants. Prior to start of construction/demolition, a Notice of Intent (NOI) must be filed with the State Water Board describing the project. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and maintained during the project and it must include the use of Best Management Practices (BMPs) to protect water quality until the site is stabilized (City of San José Website, 2020).

8.2.2 City of San José Requirements

All construction/demolition projects must comply with the City of San José's Grading Ordinance, which requires the use of erosion and sediment controls to protect water quality while the site is under construction. Prior to the issuance of a permit for grading activity that occurs during the rainy season (October 15 to April 15), an Erosion Control Plan must be submitted to the Department of Public Works detailing Best Management Practices that will prevent the discharge of stormwater pollutants (City of San José Website, 2020).

8.2.3 Stormwater Inspections & Enforcement

The City of San José regularly inspects construction sites to ensure that the projects are properly implementing Best Management Practices to protect water quality until the site is stabilized. Construction sites that are out of compliance with the San José Municipal Code will be inspected by the City more frequently and are subject to fines (City of San José Website, 2020).

9. STRUCTURAL MEASURES

Structural flood control projects within the FMP project area are used to prevent floodwaters from reaching properties. These measures are “structural” because they involve construction of structures to control water flows. They can be grouped under the following four measures, as discussed below:

- Levees/floodwalls
- Drainage Facilities and Detention Basins
- Channel and Basin Maintenance

9.1 LEVEES/FLOODWALLS

A barrier of earth (levee) or steel or concrete (floodwall) can be erected between the watercourse and the property to provide flood protection. Levees require considerable room between the river and the area to be protected. If space is a constraint, more expensive floodwalls are used. Levees and floodwalls should be set back out of the floodway so they will not push floodwater onto other properties. Their design also should compensate for the flood storage that they will displace and for access through or over the barrier.

The following projects have been undertaken in the project area to reduce flood hazards:

9.1.1 South San Francisco Bay Shoreline Phase 1 Project

The FRM features of the South San Francisco Bay Shoreline Phase 1 Project includes engineered levees along the western and northern outer dikes of New Chicago Marsh that are contiguous with the existing margins of Ponds A12, A13, and A16 and would follow the southern Pond A18 dike that runs west to east in a stair-step pattern to protect against the 1-percent ACE tidal event with anticipated sea level change; a tide gate closure system across the Union Pacific Railroad and Artesian Slough; restoration of Ponds A9, A10, A11, A12, A13, A14, A15, and A18; a transitional habitat slope of 30:1 in Ponds A12, A13 and A18; trails on top of the new proposed flood risk management levee with connection to the Bay Trail network; viewing platforms and benches, and trail upgrades to be made to an existing segment of the Bay Trail system along State Route 237.

The tidal flood protection components would be constructed between 2021 and 2025. Restoration of the ponds and recreation elements would take place between 2020 and 2031 with monitoring and adaptive management occurring throughout the period.

9.1.2 Coyote Creek Project

In the FMP project area, this project constructed channel improvements to contain flood flows up to the 1-percent ACE event, thereby reducing future flood risk to public and private property from fluvial (riverine) flooding. The Coyote Creek project improvements extended approximately 7 miles from Coyote

Creek's confluence with the bay along the eastern side of Pond A18 to Montague Expressway in the cities of San José and Milpitas.

The lower portion of the Coyote Creek project included construction of an engineered levee on bay mud across a small part of the eastern side of Pond A18. The severed portion of the pond was then breached and opened to tidal action. This portion of the Coyote Creek project became the Coyote Creek Bypass Channel and was completed in 1995 and the project provides flood protection from a 1-percent ACE for 4,700 acres of land, over 1,600 residents, 900 homes and 180 commercial and industrial establishments (Shoreline Feasibility Study, 2015).

9.1.3 Guadalupe River Project

In the FMP project area, this project constructed channel improvements to contain flood flows up to the 1-percent ACE event, thereby reducing future flood risk to public and private property from fluvial (riverine) flooding. From the Alviso Marina to Interstate-280, the Guadalupe River project improvements integrated flood protection, public access and environmental restoration.

The Guadalupe River project in the Alviso area was completed in December 2004. Floodwaters from the upper reaches of the river could be carried successfully through the Guadalupe River to San Francisco Bay by raising the existing levees and constructing floodwalls adjacent to the Guadalupe River, and raising the State Route Eastbound 237 Bridge (Guadalupe River Park Conservancy Website, 2020).This project was constructed to (1) provide 1-percent ACE flood risk management for downtown San José's technology and commercial industries and adjacent residential neighborhoods; (2) protect and improve water quality of the river; (3) preserve and enhance the river's habitat, fish, and wildlife; and (4) provide recreational and open space opportunities (Shoreline Feasibility Study, 2015). This project will safeguard hundreds of homes, schools and businesses from flooding and enhance habitat for endangered fish.

9.1.4 Levee Maintenance

Valley Water maintains the levees along Coyote Creek (bay to Montague Expressway) and Guadalupe River (Alviso Marina to Interstate-280), which are within or flow to the FMP project area.

Once construction of the Shoreline Project is complete operations, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the flood risk management features will be the responsibility of Valley Water. Periodic maintenance of the new FRM levee would be required to maintain the levee to the design elevation. Erosion and excessive vegetative growth on the levee side slopes will also require maintenance. Valley Water staff will follow USACE's operational and maintenance criteria and protocols to evaluate and maintain the levees. The USACE will also inspect the project features and recommend corrective action to ensure that the project functions as designed and to make sure the improvements meet USACE operational and maintenance requirements (Shoreline Feasibility Study, 2015).

9.1.4.1 USACE Levee Inspections

Flood risk and levee condition are dynamic. Levees change over time: banks erode, closures rust, animals burrow, and pumps wear out. Ongoing vigilance is needed to ensure that levee infrastructure will perform properly during a flood event. USACE regularly inspects levees within its Levee Safety Program to monitor their overall condition, identify deficiencies, verify that needed maintenance is taking place, determine eligibility for federal rehabilitation assistance (in accordance with Public Law 84-99), and provide information about the levees on which the public relies. Inspection information also contributes to risk assessments and supports levee accreditation decisions for the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA) (USACE Website, 2020).

USACE now conducts two types of levee inspections using a Geographic Information Systems (GIS) / Global Positioning System (GPS)-based inspection tool that incorporates a standard levee inspection checklist. Levee sponsors are encouraged to be part of the inspection team (USACE Website, 2020).

Routine Inspection is a visual inspection to verify and rate levee system operation and maintenance. It is typically conducted each year for all levees in the USACE Levee Safety Program.

Periodic Inspection is a comprehensive inspection conducted by a USACE multidisciplinary team that includes the levee sponsor and is led by a professional engineer. USACE typically conducts this inspection every five years on the federally authorized levees in the USACE Levee Safety Program. Periodic Inspections include three key steps:

- Data collection: A review of existing data on operation and maintenance, previous inspections, emergency action plans and flood fighting records
- Field inspection: Similar to the visual inspection for a Routine Inspection, but with additional features
- Final report development: A report including the data collected, field inspection findings, an evaluation of any changes in design criteria from the time the levee was constructed, and additional recommendations as warranted, such as areas that need further evaluation.

Inspection Ratings

Both Routine and Periodic Inspections result in a final inspection rating for operation and maintenance. The rating is based on the levee inspection checklist, which includes 125 specific items dealing with operation and maintenance of levee embankments, floodwalls, interior drainage, pump stations, and channels.

Each levee segment receives an overall segment inspection rating of Acceptable, Minimally Acceptable, or Unacceptable. If a levee system comprises one or more levee segments (if there are different levee sponsors for different parts of the levee) then the overall levee system rating is the lowest of the segment ratings.

A levee sponsor must maintain the levee to at least the *minimally acceptable* standard to remain eligible for federal rehabilitation assistance through the USACE Rehabilitation and Inspection Program (PL 84-99). Table 9.1-1 outlines the rubric for the USACE's Inspection Rating system (USACE Website, 2020).

Sharing the Results

USACE shares inspection results with the authority responsible for levee operation and maintenance, known as the levee sponsor. This is typically a local agency but in some cases is USACE itself. USACE also shares the results with FEMA, to help inform decisions about levee accreditation for flood insurance purposes (USACE Website, 2020).

TABLE 9.1-1
USACE Levee System Inspection Ratings

Acceptable: All inspection items are rated as Acceptable.
Minimally Acceptable: One or more inspection items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable inspection items would not prevent the segment/system from performing as intended during the next flood event.
Unacceptable: One or more inspection items are rated as Unacceptable and would prevent the segment/system from performing as intended, or a serious deficiency noted in past inspections (previous Unacceptable items in a Minimally Acceptable overall rating) has not been corrected within the established timeframe, not to exceed two years.

9.2 DRAINAGE FACILITIES AND DETENTION BASINS

Drainage facilities include constructed ditches and culverts that help drain areas where the surface drainage system is inadequate or where underground drainage ways may be safer or more attractive. Particularly appropriate for depressions and low spots that will not drain naturally, drainage and storm pipe projects usually carry the runoff from smaller, more frequent storms. In addition, storm drains also fall under the category of drainage facilities and include installing new storm drains, enlarging small pipes, improving streets, and preventing back flow.

Detaining or detention ponds are basins designed to catch surface runoff and prevent its flow from entering directly into a stream or river during a high peak flow period.

Detention pond is one of the methods to prevent localized flooding provided and they have the added advantage of not altering the character of the streams they protect. Detention pond is feasible when undeveloped lands are available. It is worth noting that there are very limited opportunities for detention ponds in the FMP project area other than the salt ponds along the South San Francisco Bay shoreline.

The following project has been undertaken in the project area to reduce flood hazards:

9.2.1 City of San José's Alviso Pump Station Project:

The project would construct the new Alviso Storm Pump Station and a new force main near the intersection of Gold and Catherine Streets to improve the stormwater conveyance capacity and help protect the Alviso area from 100-year storm events. The new pump station would include a new wet well, submersible pumps, a new generator building, a standby engine generator, a new motor control center, fuel tank, valve/diversion structure, junction box, force main, outfall discharge structure, transformer, electrical power and control systems, and necessary site improvements. The generator building would be approximately 900 square feet in size and approximately 24 feet in height to house the new standby power generator, motor control center, and other pump station operating equipment. A single 750 kW diesel engine standby generator set would be installed inside the new generator building to power all the pumps associated with the new pump station simultaneously during a power outage. The existing Gold Sreet Pump Station and outfall would remain in operational condition during construction of the new Alviso Storm Pump Station and will be used in emergency flooding situations and as a permanent backup in case of failure at the new Alviso Pump Station (CEQA Website, 2020).

9.3 CHANNEL AND BASIN MAINTENANCE

Clogged or broken drainage systems can seriously impair stormwater management efforts. Flood channels, storm drains, detention ponds, and erosion basins can become blocked by overgrowth, debris, sedimentation, or components that fail with age.

Channel and detention basin maintenance is an ongoing program to clean out blockages caused by overgrowth or debris. These activities normally do not affect the shape of the channel or basin, but they do affect how well they can perform.

The following outlines channel and basin maintenance programs that are implemented by the local agencies to prevent flood hazards within the FMP project area:

9.3.1 Santa Clara Valley Water District Stream Maintenance Program (SMP)

Valley Water's Stream Maintenance Program (SMP) ensures flood protection projects continue to function as designed to protect homes and businesses along Valley Water streams. There are more than 800 miles of creeks in Santa Clara County. Valley Water owns 278 miles of these creeks, but only a portion of these have been modified with flood protection projects. Those are the creeks that are maintained by Valley Water. Valley Water crews regularly inspect stream and bank conditions. Toward the end of the rain season, staff finalize the proposed work plan for the upcoming work season (2014-2023 Stream Maintenance Program Manual, 2014).

From June to October, after securing State and Federal regulatory agencies' approval of the work plan, crews trek into streams to remove sediment, manage vegetation, clear trash and debris, and stabilize banks that have eroded. While the heavy work takes place in the summer, stream maintenance is a year-round effort (2014-2023 Stream Maintenance Program Manual, 2014).

During heavy storms, unruly vegetation and sediment washed down from areas upstream can restrict the flow of water and in some areas, cause a back-up, increasing the risk of flooding. Valley Water monitors known “hot spots” for vegetation and debris buildups and where needed and safe to do so, take action to remove these blockages and reduce the threat of localized flooding (2014-2023 Stream Maintenance Program Manual, 2014).

Stream maintenance work also includes an integrated vegetation management program which provides many benefits. Removal of in-stream vegetation ensures flow conveyance. Upland vegetation management is performed to meet fire code compliance and maintenance access. Native planting and invasive plant removal projects improve the ecological habitat of the riparian ecosystem (2014-2023 Stream Maintenance Program Manual, 2014).

Valley Water has completed the Coyote Creek (bay to Montague Expressway), Berryessa Creek (Lower Penitencia Creek confluence to Interstate-680), and Guadalupe River (Alviso Marina to Interstate-280) projects, all of which are within or flow to the FMP project area, and continues to maintain these projects. Valley Water will be responsible for maintaining the flood risk management features of the Shoreline Phase 1 Project once construction for the project is completed to reduce flood hazards. In addition, USACE will be preforming annual inspections to ensure the flood risk management improvements meet USACE Operational and Maintenance requirements after the Shoreline Phase 1 Project is completed.

10. EMERGENCY MANAGEMENT

People at risk from disasters, whether natural or human in origin, can take actions that save lives, reduce losses, speed response, and reduce human suffering when they receive accurate warnings in a timely manner. Warnings are becoming much more useful to society as lead-time and reliability are improved and as society devises ways to respond effectively, especially now that we are experiencing climate change and more frequent and disastrous events. For example, computers are being programmed to respond to warnings automatically, shutting down or appropriately modifying transportation systems, lifelines, and manufacturing processes for example.

Effective warnings should reach, in a timely fashion, every person at risk who needs and wants to be warned, no matter what they are doing or where they are located. Such broad distribution means utilizing not only government-owned systems such as NOAA Weather Radio and local sirens, but all privately owned systems such as radio, television, pagers, telephones, the Internet, and printed media.

Emergency management measures that protect people during and after disasters are described in local Emergency Operations Plans (EOPs) and Standard Operation Plans (SOP) These plans should cover the following two areas:

10.1 FLOOD THREAT RECOGNITION AND EMERGENCY WARNING

Hazard analysis is the basis for both mitigation efforts and EOPs. From an emergency operations planning perspective, hazard analysis helps a planning team decide what hazards merit special attention, what actions must be planned for, and what resources are likely to be needed.

The first step in responding to a disaster is knowing that one is coming. Scientists are developing more accurate and more numerous warnings as they deploy better sensors to measure key variables, employ better dynamic models, and expand their understanding of the causes of disasters. Warnings can now be made months in advance, in the case of El Niño, to seconds in advance of the arrival of earthquake waves at some distance from the earthquake. The new NWS Doppler radar systems are providing the capability to diagnose the potential for severe thunderstorms, tornadoes, and flood-producing rainfall. As a result, warnings are becoming predictive in nature rather than reactive.

Local plans should describe how natural hazard threats are identified. The plan should include information on each of the hazards identified for the community. Of particular interest are the hazard's frequency of occurrence (both historical and predicted or probable, as available), magnitude and intensity, location (if the hazard is associated with a facility or landscape feature) and spatial extent (either around the known location of the hazard or as an estimate for non-localized hazards like tornadoes), duration, seasonal pattern (based on month-by-month historical occurrence), speed of onset, and availability of warning.

The following provides an outline of the City of San José and Valley Water's Flood Emergency Action Plan for this FMP's project area:

10.1.1 Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José

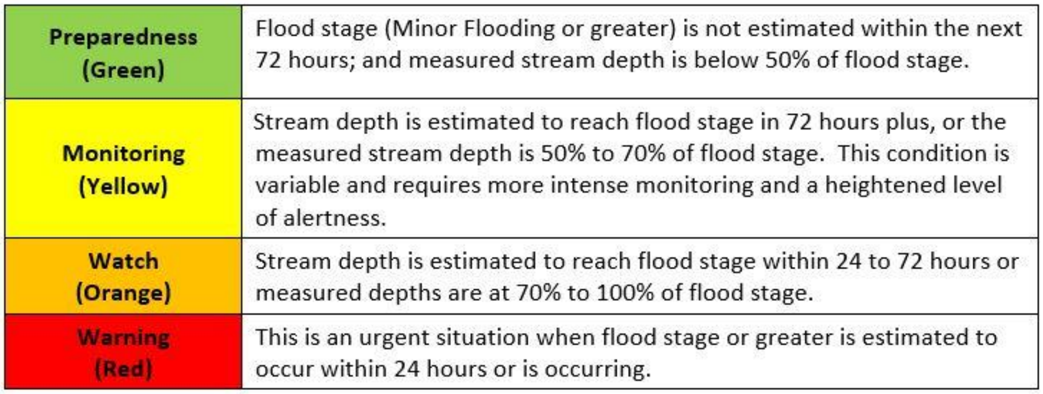
The City of San José and Valley Water have created a Joint Emergency Action Plan (EAP) for severe storms and flood response. The plan outlines how the City and Valley Water manage, prepare for and communicate about flooding issues on Coyote Creek, Guadalupe River and other waterways where flooding might occur.

Valley Water provides flood management services for Santa Clara County. During severe storm events and high flows in the flood prone creeks, Valley Water implements emergency actions to minimize loss and damage to life, property, and the environment. To do this, Valley Water works closely with partner agencies, landowners, and other stakeholders to ensure a coordinated approach during emergency events (Joint EAP City of San José, 2018).

To improve the response to potential or actual flooding events, this Emergency Action Plans has been developed to provide guidance on how the City of San José and Valley Water will prepare and respond to severe storm and high flow events. The plans describe 5 basic steps taken in response to storms and flood events (Joint EAP City of San José, 2018).

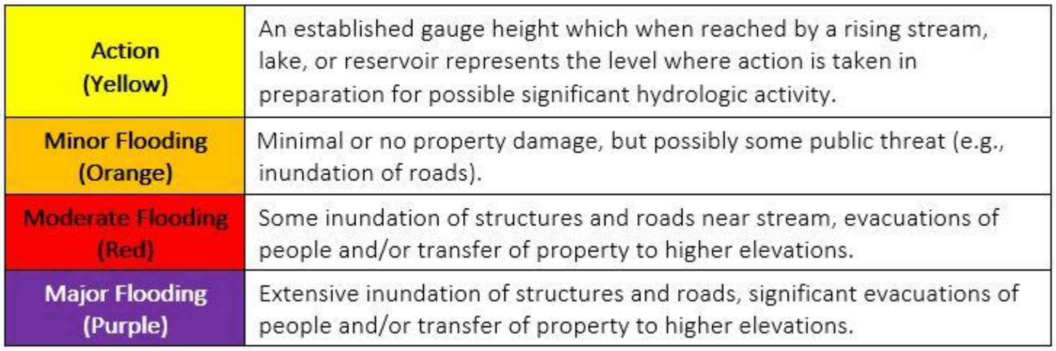
1. Event Detection
2. Condition Level Determination
3. Notification and Communications
4. Actions and Responsibilities
5. Termination and Follow-up

A key component of these plans is to create an easy-to-understand and easy-to-communicate classification system for setting a condition level based on flood risk and flood severity. Before and during events the level of risk for flooding uses the color-coded system shown below:



Preparedness (Green)	Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours; and measured stream depth is below 50% of flood stage.
Monitoring (Yellow)	Stream depth is estimated to reach flood stage in 72 hours plus, or the measured stream depth is 50% to 70% of flood stage. This condition is variable and requires more intense monitoring and a heightened level of alertness.
Watch (Orange)	Stream depth is estimated to reach flood stage within 24 to 72 hours or measured depths are at 70% to 100% of flood stage.
Warning (Red)	This is an urgent situation when flood stage or greater is estimated to occur within 24 hours or is occurring.

With the risk of flooding classified, the urgency of an event can be communicated and actions planned. However, for actions to be most appropriate to the event, it is important to also understand and communicate how severe the event may be and what areas may be affected. Valley Water and the National Weather Service both provide this type of classification. Below are the flood severity descriptions used by both agencies:



Action (Yellow)	An established gauge height which when reached by a rising stream, lake, or reservoir represents the level where action is taken in preparation for possible significant hydrologic activity.
Minor Flooding (Orange)	Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).
Moderate Flooding (Red)	Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.
Major Flooding (Purple)	Extensive inundation of structures and roads, significant evacuations of people and/or transfer of property to higher elevations.

With an event's risk and severity established, the responsible agencies can best coordinate to provide a comprehensive response specific to the event (Joint EAP City of San José, 2018).

10.2 RESPONSE AND MITIGATION OPERATIONS

Warnings are effective only if they are accurate and result in appropriate action. Appropriate response to warning is most likely to occur when people have been educated about the hazard and have developed a plan of action well before the warning. EOPs developed using the functional approach consist of a Basic Plan, functional annexes, and hazard-specific appendices. These are supplemented by the SOPs and checklists necessary for implementation of the EOP. The Basic Plan is an overview of the jurisdiction's emergency response organization and policies. It should:

- Provide the legal authority for emergency operations;
- Summarize the situations addressed by the EOP;
- Explain the general concept of operations;
- Assign responsibilities for emergency planning and operations;
- Describe how people and property will be protected in emergencies and disasters; and
- Identify steps to address mitigation concerns during response activities.

The following outlines the local agencies' emergency response and mitigation operation procedures:

10.2.1 City of San José Emergency Operation Plan 2019

The City of San José Emergency Operations Plan (EOP) provides an overview of the city's approach to emergency operations. It identifies emergency response policies, describes the response and recovery organization, and assigns specific roles and responsibilities to City departments, agencies, and community partners. The EOP has the flexibility to be used for all emergencies and will facilitate response and recovery activities in an efficient and effective way. The EOP provides a description of the intended audience, the method of distribution, the approval process, and its applicability to other plans. The plan describes the role of the City of San José's Emergency Operations Center (EOC) and the coordination that occurs between the EOC, Department Operations Centers (DOCs), Disaster District Offices, field responders, and external entities such as the Operational Area, community partners, and City residents and visitors (EOP Base Plan, City of San José, 2019).

This EOP is an evolving, dynamic document, and the City of San José Office of Emergency Management (OEM) is responsible for maintaining it. This plan complies with the National Incident Management System (NIMS), the National Response Framework (NRF), the Standardized Emergency Management System (SEMS), the Incident Command System (ICS), and is in alignment with Santa Clara Operational Area Emergency Operations Plan, and the California State Emergency Plan (SEP) (EOP Base Plan, City of San José, 2019).

The purpose of the EOP is to establish the foundational policies and procedures that define how the City will effectively prepare for, respond to, recover from, and mitigate against natural or human-caused disasters. It provides a description of the emergency management organization and how it is activated. It also addresses the following issues:

- Identifies the departments designated to perform response and recovery activities and specifies their roles and responsibilities;
- Sets forth lines of authority and organizational relationships and shows how all actions will be coordinated;
- Describes the system used to coordinate the request for and integration of resources and services available to the City during disaster situations;
- Specifies the coordination and communications procedures and systems that will be relied upon to alert, notify, recall, and Emergency Operations Center personnel; warn the public; and protect residents and property;
- Identifies supporting plans and procedures applicable to the EOP and referenced as plan annexes or appendices;
- Describes the emergency management organization and transition of priorities and objectives to address post-disaster recovery considerations;

- Reflects the most recent guidance for emergency planning and consider better alignment with county, state, and federal emergency plans to support a unified approach to emergency management;
- Formalizes protocols that reflect best practices and operational realities;
- Develops hazard-specific plans that are scalable, actionable, and realistic;
- Provides a response structure for all-hazards; and
- Describes how to address the needs of those with access and functional needs (AFN), and integrate Americans with Disabilities Act requirements in all aspects of preparedness, response, and recovery.

10.2.2 Valley Water: Emergency Response Project

Valley Water is currently working on an Emergency Response Project where Valley Water works with local municipalities to clearly identify roles and responsibilities for floodplain management and flood emergency management and increase awareness of the Valley Water's flood response procedures. The project supports countywide emergency response and preparedness activities, develops communication procedures and disseminates web-based flood forecasting information. Collaborators also develop formal, site-specific flood response procedures or action plans (flood-fighting strategies), and coordinate outreach throughout the county so that the public receives uniform flood warning messages (Valley Water Website, 2020).

This project is comprised of two (2) sub-projects that support Valley Water's emergency response planning. These sub-projects are:

10.2.2.1 Safe Clean Water Project E2.1: Coordination with Local Municipalities on Flood Communication

- On December 9, 2019, Valley Water re-started exercise planning with the City of San José in preparation for two scheduled exercises in January 2020 that will test the Joint Emergency Action Plan (EAP) as required by the EAP agreement.
- On December 5, 2019, Valley Water Emergency Services and Security (ESS) hosted the Winter Preparedness Workshop at Valley Water. The purpose of the workshop was to discuss the predicted weather forecast for the upcoming winter season, how agencies have prepared for the winter, resources for agencies and the public, and what a coordinated response to emergency situations would look like. Valley Water and external agencies delivered presentations on the different types of flooding, monitoring/response capabilities, and emergency management coordination. The workshop was attended by 71 participants, which included representatives from: NASA Ames Moffett Field, Palo Alto OES, Santa Clara County Fire, Santa Clara County

Office of Emergency Management, Santa Clara Kaiser, Sunnyvale Department of Public Safety, Town of Los Gatos, Kaiser Santa Clara, Morgan Hill CERT, Milpitas OES, Department of Water Resources, National Weather Service, Morgan Hill OES, Emergency Response Team NASA, American Red Cross, Cupertino OES, CAL Fire, County of Santa Clara Public Health Department, City of San José OES, Mt. View Fire, Palo Alto Public Works, and the cities of: Morgan Hill, Mountain View, Palo Alto, San Jose, Santa Clara.

- During the January and February 2019 rainstorms, Valley Water's EOC activations included close collaboration with the City of San José and adherence to the Joint EAP agreed upon and finalized in 2017 (updated in 2018). The updates, in general, reflect work being accomplished by the City of San José in working very close with Valley Water staff.

10.2.2.2 Safe Clean Water Project E2.2: Flood-Fighting Action Plans

- The Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José was updated and revised by Valley Water and the City of San José in December 2018.

11. PUBLIC INFORMATION

Strong community floodplain management programs emphasize outreach and education, as well as identifying and minimizing risk. The most effective programs reach the general public, decision makers, developers, and design professionals with messages that help them know the hazards, know how to protect themselves, and understand how their actions affect others.

The CRS highly encourages and rewards public information activities in the following areas:

11.1 MAP INFORMATION

There are many benefits to providing map information to the public. Residents and businesses who are aware of the potential flooding hazards can take steps to avoid problems and/or reduce their existing exposure. Real estate agents and house hunters can find out if a property is flood prone and whether flood insurance may be required.

Communities (as designated by the CRS system) are the best source of map information because they can often supplement what is shown on the FIRM with maps that complement and clarify the FIRM and with information on additional hazards, flooding outside mapped areas, and zoning.

11.1.1 Current Practice in the County of Santa Clara

Valley Water provides information and links to FEMA's flood maps which allow viewers to determine if their property is in a 100-year flood zone at: https://www.valleywater.org/floodready/is-your-home-in-a-flood-zone. In some locations Valley Water has completed updated flood studies and may have information on flooding for more frequent events or subject to flooding to a depth less than one foot.

11.2 OUTREACH PROJECTS

Information can be presented in several ways, including pamphlets, brochures, and other literature; workshops; and radio and TV ads. Marking historical disasters, such as flood levels, in prominent places can be an effective way of increasing community awareness of natural hazards. Important topics to cover with a general awareness program include things to consider when purchasing a home or business, means of identifying hazards, and ways to limit exposure and reduce future property damages. Awareness programs that are specifically targeted at new home buyers should educate them on mitigation techniques and features to look for when considering the purchase of a home in a hazard area.

Both education and regulation are more effective when they are paired than when they stand alone. Planning could be considered a community awareness program, since participation in the planning process can help communities establish a feeling of "ownership" over mitigation measures. This, in turn, may help generate public support for mitigation. Awareness and outreach programs should be targeted at people who are directly affected by mitigation activities, such as acquisition programs, to address their concerns and to explain the importance and consequences of these actions.

Outreach projects are a proactive approach to public information. They educate individual residents about various topics and are designed to encourage people to seek more detailed information in order to take action to protect property. They can cover a variety of topics, such as the flood hazard, flood insurance, mitigation measures, flood warning procedures, and local regulations.

11.2.1 Current Practice in the County of Santa Clara

Valley Water has developed Flood Ready information to increase emergency preparedness of the residents living in Santa Clara County. The following contents related to Flood Safety are available on line at the Valley Water website (https://www.valleywater.org/floodready):

- Flood Safety Advice: Before, During, After Flooding
- Sandbag Guidelines for Homeowners
- Sandbag Distribution Centers

Valley Water encourages residents to participate in AlertSCC**,** the Santa Clara County emergency alert system. A link to sign up for Alert SCC is available at the Valley Water website (https://www.valleywater.org/floodready/sign-up-for-emergency-alerts). AlertSCC is a free, easy, and confidential way for anyone who lives or works in Santa Clara County to get emergency warnings sent directly to their cell phone, mobile device, e-mail, or landline. AlertSCC can reach you wherever you are to provide information and instructions in a variety of emergency situations, which may include:

- Flooding, wildfires, and subsequent evacuations

- Public safety incidents, including crimes, that immediately affect your neighborhood

- Post-disaster information about shelters, transportation, or supplies

In addition to AlertSCC, Valley Water also promotes downloading the ReadySCC emergency preparedness app. A link to download the ReadySCC app is available at the Valley Water website (https://www.valleywater.org/floodready/sign-up-for-emergency-alerts). The app allows users to set a meeting point for their family, list emergency contacts in and out of town, assign a caretaker for their pets and send status updates to their loved ones during an emergency.

Valley Water has prepared reports following instances of severe flooding. These reports, available at the Valley Water Website (https://www.valleywater.org/floodready/flood-reports), provide an analysis of circumstances that led to individual flood events and document the areas that were flooded. In addition, they provide a good summary of historic flood damages, as well as valuable information about planning for potential future flood events in Santa Clara County.

11.3 REAL ESTATE DISCLOSURE

Federally-regulated lending institutions must advise mortgage or other loan applicants that the property is in a floodplain as shown on the FIRM. Because this requirement has to be met only ten days before closing, often the applicant is already committed to purchasing the property when he or she first learns of the flood hazard.

State laws and practices by local real estate boards can overcome this deficiency and advise newcomers about the hazard earlier. They may also require disclosure of past flooding or storm drain problems, regardless of whether the property is in a mapped floodplain.

In some areas, state or local real estate disclosure laws require that the buyer be notified if the property is located in a hazard-prone area. Advocates argue that a better-informed marketplace should result in better decision-making: well-informed consumers will choose to avoid purchase in hazard areas, demand a lower price, or pursue mitigation actions after purchase. Some examples of the hazard conditions that may require disclosure include settling from any cause; flooding, drainage, or grading problems; flood insurance requirements; and property or structural damage from fires, hurricanes, earthquakes, or floods.

Local practices by local real estate boards can make notification practices effective by requiring that newcomers be advised about hazard risks thoroughly and early in the homebuying process. Real estate boards may also require prospective homeowners to disclose past disaster events, regardless of whether the property is in a mapped high-risk zone.

11.3.1 Current Practice in the County of Santa Clara:

The State of California Real Estate Department requires disclosure of whether a property is in a floodplain or an area of potential flooding shown on a map as an area that will be inundated if a dam fails (State of California Real Estate Department, 2005). The standard form notes that these hazards areas – Special Flood Hazard Areas, areas of potential flooding from a dam failure, wildland areas that may contain substantial forest fire risks and hazards, earthquake fault zones, and seismic hazard zones – may limit the buyers' ability to develop the real property, to obtain insurance, or to receive assistance after a disaster. Further, the seller or seller's agent has a duty to disclose material facts that she or he knows or reasonably should know (State of California Real Estate Department, 2005).

11.4 LIBRARY

The community library is open for residents to seek information on flooding, flood protection, and protecting natural resources. Libraries are usually the first place that people turn to when they want to research a topic. Libraries also have their own public information campaigns with displays, lectures, and other projects, which can augment the activities of the community.

11.4.1 Current Practice in the City of San José:

The City of San José maintains and updates an extensive catalog of floodplain management related publications in its library system. In addition to the Flood Insurance Study and Flood Insurance Rate Maps, the library collection has books and resources on flood damage prevention, including state, regional, and locally pertinent documents, as well as flood damage reduction publications in the Spanish language. Community members are able to research floodplain management related publications on the San Jose Public Library online catalog at https://www.sjpl.org/.

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